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ORIGINAL COMMUNICATIONS.

CONSTIPATION IN INFANCY AND CHILDHOOD.[1]

BY J. P. CROZER GRIFFITH,
Professor of Pediatrics in the University of Pennsylvania.

The importance of the study and treatment of constipation in infancy and childhood can hardly be overestimated. In many healthy, thriving infants with good digestion, well in other respects, the matter may often be safely disregarded, and the treatment may be merely of a temporizing nature. In other cases, both in infants and children, a large variety of symptoms depend upon it. Thus we have in this category chronic loss of appetite; recurrent abdominal pain; obstinate eczema; hernia; irregular attacks of fever; persistent or repeated headaches; frequent attacks of vomiting; insomnia, convulsions, and a large array of other nervous symptoms, which often cannot be relieved until the chronic constipation is removed. It is important to determine what we mean by constipation. A child may have a sufficient number of evacuations of the bowel, but these may be hard and passed with difficulty. This, of course, is constipation. On the other hand, the stools may be normal in character and even soft, as they should be in infancy, and yet passed so infrequently, and perhaps only with aid, that here, too, we equally well speak of constipation existing.

In studying the causes of the condition, which is necessary before we refer to treatment, we may divide the matter conveniently into (1) constipation in infancy, and (2) constipation in older children. In infants we find such organic causes sometimes existing as atresia of the anus; stenosis of the pylorus; idiopathic dilatation of the colon; stenosis somewhere in the course of the intestine; invagination; and the like. We may, however, pass these by as of minor importance, because much less frequent, and refer only among the organic causes to the unusually long and sinuous condition of the sigmoid flexure, which has been shown by Jacobi and others to be a normal characteristic of early life. Unquestionably the existence of this is one of the reasons why so many infants tend to be constipated. It is a condition which, of course, cannot be removed, and the symptom has to be treated irrespective of it.

Of functional causes, the first to be mentioned is a sort of paresis or atony of the intestine. The infant may go even for days without an evacuation, unless aid be given. Perhaps the feces may be in the rectum in a soft state, but there may be an insensitiveness of the mucous membrane, or a lack of proper peristaltic action, which prevents expulsion. Often constipation depends upon the diet. Some infants digest their food so well and so completely that there is not sufficient of it to make a good stool. This is, then, a *relative* insufficiency. There is not enough food, so far as the bowel movements are concerned, although the child is growing well. Other children suffer from an *absolute* insufficiency. There is actually not sufficient food, and the children do not thrive, and suffer as well from constipation. One of the most frequent causes in infancy is some fault in the character of the food.

[1]Read before the North Branch of the Philadelphia County Medical Society, May 23, 1914.

Sometimes there is, for instance, too little fat, and the stools are hard as a result; while in other instances too much fat in the food forms abundant whitish fecal masses of insoluble soap. Before dietetic treatment can be commenced it is, naturally, of the utmost importance to determine whether we are dealing with too much or too little fat. Bottle-fed babies are particularly liable to suffer from constipation from an excess of fat.

The influence of the heating of the food is doubtful. Much has been written upon each side. There is no question that some babies are constipated when upon milk which has been pasteurized, boiled, or sterilized in some way, while in others no such effect is produced. There seems reason to believe that sterilization, take it all in all, has a certain tendency to produce constipation.

Next we can consider the causes of constipation in older children. Here, too, we have first to deal with organic causes, or those the result of some positive disease not directly connected with the intestinal tract. Rickets produces in many cases a tendency to constipation, the result of the atony of the abdominal and intestinal muscles, and of the consequent lack of proper expelling power. I have seen fissure of the anus make a child entirely unwilling to put forth the effort necessary to have an evacuation of the bowel. Such serious diseases as meningitis, peritonitis, and the like are constantly accompanied by constipation. In attacks of recurrent vomiting there is often such obstinate constipation that obstruction of the bowel is feared. Oftener, however, the symptom at this age is due to some functional disturbance, beginning even in the second year of infancy. We find constipation a common result of the administration of too much milk, to the exclusion of a proper amount of other food. The diet in general is one which does not contain enough waste material. Another extremely frequent cause is lack of proper training. The children are unwilling to take sufficient time for an evacuation of the bowels, unless this is insisted upon. Such disorders as general debility and anemia brought about in any way diminish the tone of the bowel as well as of other parts of the body, and favor an insufficient peristalsis. Even in healthy children a lack of sufficient exercise is a common cause of this condition. I have known children who were obstinately constipated in winter-time, but had no trouble when spending the summer in the country. Finally, one of the most frequent causes of very troublesome constipation is chronic intestinal indigestion, going by the name of mucous disease and many other terms.

This is all the time permits of saying with regard to the causes; and with these in view we may discuss treatment. Always to be considered is whether treatment is really necessary. Healthy, thriving, constipated infants often do better if let alone, except for relief from time to time when it is needed. We can always feel much safer with such an infant than with one disposed to diarrhea. In such cases we must not too quickly make a change in the food, since we do not know what evil results may follow. In the matter of relief in infancy, we can use such well-known remedies as the soap-stick, small injections of saline solution or of soapy water, glycerin suppositories, the addition of milk of magnesia to the bottle, the giving of orange juice and the like—changed from time to time in order to prevent the establishment of tolerance for any one treatment. Naturally the use of all such remedies is an evil; but it is an evil we can well put up with lest worse may come—knowing that as the child grows older and the food is made more varied, the difficulty will probably disappear. When these measures fail, or when treatment is more urgent, we may employ such remedies as syrup of senna, some of the less disagreeable preparations of cascara, phenolphthalein, or small doses of milk of magnesia. Lavage of the colon often well relieves an attack of colic in an infant who has not recently had an evacuation of the bowel. Castor oil is a bad remedy, as it leaves the patient more constipated afterwards; and the same thing is true, to some

extent, of rhubarb. In many bottle-fed infants, especially those not in the best of health in other respects, an alteration of the food is of service. The increase of the amount of fat may be of benefit but is a somewhat risky procedure, as it may result in the production of a gastric indigestion difficult of cure. I never make the practice of increasing the amount of cream in the bottle of a child in the first year merely for the sake of relieving constipation. There are better measures. The addition of a cereal diluent may aid, especially that of oatmeal. The action of the other cereals is uncertain. In some cases barley-water makes a child more constipated; in other cases it seems to produce looseness of the bowels. An excellent procedure in some cases is the employment of a dextrinized gruel for the diluent. A large amount of starchy addition can be used in this way, if it is previously warmed with a small quantity of a good extract of malt. By this dextrinizing process the gruel is rendered thin enough to mix readily with the milk, and to go through the holes in the nipple; a considerable amount of the starch having been converted into maltose and some of the other substances intermediate between this and starch. The stools become softer and brown in color, as one sees them whenever any dextrinized starch in large amount is given. Mellin's food, as is well known, has this effect, and is often used for the purpose of relieving constipation; but there is absolutely no reason for us to employ any such proprietary preparation, since we can just as readily and simply and cheaply have the mother dextrinize the starch at home. Massage of the abdomen is frequently of service, as is the plan of putting the infant upon the pot at regular intervals. It is surprising how early in life infants can be trained to evacuate their bowels at regular times in this way.

In older children the relief of constipation is usually very important, but often very difficult. The whole dietetic and hygienic conditions which surround the child must be studied, as well as the state of the general health. In some cases a large amount of exercise suffices. I recall one little boy to whom I gave purgatives of such strength that I was afraid to increase them further, yet without any effect at all. When he was taken to the mountains for the summer, the exercise which followed the climbing up and down the hills was sufficient to relieve the difficulty entirely. Massage of the abdomen is one of the best procedures in obstinate cases. Naturally, general tonic remedies are often required, especially cod-liver oil, when it is well tolerated; and all such conditions as anemia, rickets, and the like are to be removed by treatment. The insisting upon a regular visiting of the toilet at a time of the day when there is no hurry is one of the best of remedies. The choice of the hour is, however, important. It is foolish, for instance, to have a little child go to the toilet at a time of day when he knows that in a few minutes the start for school must be made. Nothing can be gained by this; for at this age, as in adult life, mental quiet and peace of mind are necessary. Further, food should be selected which is of a laxative nature, such as stewed prunes or other fruit, asparagus tips, string-beans, spinach, stewed salsify, lettuce, and the like. At this time of life the addition of a rather large amount of butter is of service, or of cream, if it is well tolerated; and it is better borne now than in infancy. Of the cereal porridges, oatmeal is to be preferred, and graham bread should replace entirely the ordinary white bread. I have had excellent results, too, with bran gems,[1] made in the patient's home according to the recipe given in some of the cook-books. Sometimes these alone are sufficient to control a constipation which has been very troublesome. In many cases it is necessary to reduce the amount of milk, and constipation will not be relieved until after this has been done. The occasional administration of figs, dates, or French prunes is of value when children refuse the ordinary cooked fruit or other table food of a laxative nature.

[1] Mix 1 pint of bran, ½ pint of flour, and 1 level teaspoonful of baking soda. Mix ½ pint of milk and 4 tablespoonfuls of molasses. Add this to the bran mixture and bake in gem pans.

Of purgative drugs, which should at best be but a temporary makeshift, perhaps preparations of cascara are the best, and with these may be combined phenolphthalein or senna. Paraffin oil has come into prominence of late, and is useful in many cases. It may be given undiluted, if children will take it, or mixed with peppermint or other flavoring substance.

Lastly, I wish to speak especially of a method I have found very serviceable in obstinate constipation combined with other symptoms of chronic intestinal indigestion. These cases are very troublesome, and are often attended by a large array of other morbid conditions, which the relief of the constipation will cure. Just before retiring the child should be given a rectal injection of several ounces of olive, cottonseed, or other bland oil. From four to eight ounces may be employed, depending upon the age of the patient and its tolerance. This oil should be retained in the bowel over night, and will be so in the majority of cases, except in quite young children. In the morning the child visits the toilet, when he will generally have a movement without trouble, the feces now being in quite a soft state. If there is difficulty on account of the lack of peristalsis, then on first arising in the morning he may take a small amount of saline laxative, such as Apenta water. This soon suffices to produce an evacuation, and generally after a short time the giving of the saline may be omitted, the oil alone being found to be sufficient. Of course, with this treatment all the dietetic and hygienic measures referred to are to be carried out, together with the administration of such remedies as nux vomica and soda in combination. Why this combination is so good I do not know, but certainly in my hands it has been followed by excellent results. With the method just described I certainly have had some brilliant cures; although naturally it does not succeed in all instances. After a sufficiently long time it will usually be found that all treatment for constipation may be gradually withdrawn.

And now, gentlemen, I have run over briefly, as far as the time has permitted, some of the causes of constipation, as far as their study helps us in determining the treatment, and some of the various treatments which we may employ. The subject, of course, is very large, and many other methods of treatment exist which may occur to you in practice, so that what I have said can be regarded as no more than an outline.

THE VALUE OF AROMATIC SPIRITS OF AMMONIA IN ANESTHETIZATION.

BY I. I. PARSONS, M.D., MEDIA, PA.

Considering, first, the physiological actions of ammonia as a basis for our therapeutic application in anesthetization, we find that ammonia accelerates the rate and increases the depth of respiration by directly stimulating the respiratory center. Upon the circulation it acts as a marked stimulant as long as it is administered, increasing the pulse-rate, the pulse force, and the arterial pressure. The increased pulse-rate depends upon stimulation of the accelerator nerves of the heart and of the heart itself, as does the increase in its force. The rise in arterial pressure is due to the increased amount of blood pumped into the arteries by the stimulated heart and probably to a stimulant action on the vasomotor center.

These facts readily account for the beneficial effects produced in the various stages of anesthetization by the use of aromatic spirits of ammonia. It may be administered through the same cone or other appliance that is used, and given in the same manner as the anesthetic itself, preferably by the drop method, except where immediate effect is required, when it may be necessary to use it in greater concentration. In the first stage of anesthetization, when the patient's breathing is so slow or so shallow as to greatly delay the influence of the anes-

thetic and unduly prolong this period, a few drops of the aromatic causes the patient to breathe more deeply and more rapidly. This will often prevent the very disconcerting experience of finding the patient uninfluenced by the anesthetic after a period of five or ten minutes.

Near the end of the first stage, when the breathing becomes very irregular and the patient either voluntarily or involuntarily stops breathing, respiratory action is quickly obtained by the vapor of the aromatic spirits of ammonia acting on the sensitive mucous membrane of the respiratory passages. Or if at this time obstinate coughing or gagging or vomiting presents itself, the administration of ammonia will quickly overcome these unpleasant features. When at the period of transition between the first and second stages of anesthesia the patient becomes deeply cyanosed and the muscles of the jaw spasmodically contracted, the aromatics offer a most valuable aid to other restorative measures. On several occasions I have seen patients in this condition—cyanosed until purplish, muscles spasmodic, breathing suspended—stimulated to recommence respiratory movements by the aromatic vapor that acted on the nasal and pharyngeal air-passages.

During the second stage of anesthesia of children or old people or those whose condition is unfavorable for operation, the administration of aromatics along with the anesthetic all during the operation produces a mild stimulation of sufficient degree to keep the patient free from danger and allow the surgeon to give undivided attention to the operation. This method of procedure is undoubtedly superior to the use of oxygen in combination with the anesthetic, for not only does the patient obtain an increased supply of oxygen from the deepened respiration, but in addition is under the influence of a mild circulating stimulant which causes the oxygen to be more quickly absorbed and disseminated in the tissues. If by means of the aromatic we can thus stimulate a weak patient he will not only be able to remain under the influence of the anesthetic for a longer time, but his vitality will be greater afterward. If a rapid, thready pulse and quick, shallow respiration with cyanosis indicate that the patient's condition is critical, a suspension of the anesthetic and the administration of aromatic spirits of ammonia by the drop method will improve the patient's condition in a surprising manner. If in addition the patient is allowed to recover from the anesthesia until he begins to come from under its influence, the recovery of the vital centers to their normal condition will immediately show in the stronger pulse, the rapid recovery from cyanosis, and a deepening of respiration. Whenever, therefore, any uncertainty exists as to a patient's condition, if it becomes at all alarming or if it is doubtful as to the degree of reaction of which the patient is capable, no time should be lost in administering aromatics and allowing him to come up to sufficient degree to cause a general stimulation.

Finally, in the last stage of anesthesia, when the operation is almost completed, the administration of aromatics will bring a patient out from under a deep anesthesia as steadily as the ether caused him to go under. By this means, and by vigorously rubbing the face with a coarse towel and flushing the eyes with boric solution, we bring about a stimulation that results in the ideal condition of having the patient recover from the anesthesia before leaving the table.

Postoperative nausea and vomiting—the most disagreeable feature of anesthesia—can almost without exception be prevented or controlled by allowing the patient to inhale aromatics while coming out of the anesthesia. In this instance a few drops of the aromatics are poured on a gauze sponge and held about three inches from the nose. The nurse at the bedside may continue this administration as long as nausea exists. When the patient recovers sufficiently to be able to swallow he may be given a half-drachm of aromatics in water as a further means of settling the stomach and causing stimulation.

Finally, in children and old people, or those weakened by a long operation, or in those in whom for any reason a postoper-

ative catarrhal congestion of the lungs is to be feared, the administration of ten or twenty drops of aromatics by mouth every few hours will cause subsidence of the catarrhal symptoms and insure free, unobstructed breathing.

The routine use of aromatic spirits of ammonia as herein described will no doubt soon establish for the aromatic bottle a place on the anesthetizer's table of only second importance to that of the anesthetic itself.

THE THERAPEUTIC USES OF PREPARATIONS OF THE DUCTLESS GLANDS.

BY ROBERT G. TORREY, M.D., PHILADELPHIA.

In the recent work in the realm of physiology there are a few efforts which stand out as possibly of striking importance. Some years ago the theory of anaphylaxis was advanced by Poirtier and Richet, and their hypotheses have to a large extent been supported by subsequent investigation. The benefit already attained by the practical application of their theories is incalculable. More recently the work in the von Noorden clinic, particularly by Eppinger and Hess, holds a wealth of suggestion and has already borne fruit in the clinical field.

Countless investigators are now working on the problems presented by the ductless glands—their interrelationship and the physiological effect of their activity in health and in states of disturbed function. The relationship of the ductless glands to the nervous tone is not as yet well understood. It seems definitely established that the pancreas produces an internal secretion which acts as a sympathetic depressant; that the chromaffine system as a whole acts as a sympathetic stimulant, or at least as an activator of certain portions of the system; and that the thyroid and hypophysis both in some way inhibit the activity of the pancreas in its nervous effect. This whole subject is so shrouded in doubt, however, that the theoretical side will not be considered here, this paper being limited to a discussion of the therapeutic experimentation which is being attempted with the ductless gland preparations.

Much of this work is pure speculation, much of it doubtless altogether useless, but time and experience will certainly extract some facts which are valuable and which can be shown to rest on a solid foundation. In attempting to put these theories to practical therapeutic use, the broadening of the field of endeavor depends on the practicing physicians. Those who are acquainted with these theories will be on the alert to recognize many interesting conditions which would otherwise escape observation.

THE ADRENAL GLAND.

The adrenal gland or suprarenal body is of all the glands the one about which the most accurate information has been acquired. The isolation of an active principle of a definite chemical nature has made possible experimental work which is more exact than is usual in dealing with animal substances.

The suprarenal body is composed of two portions, morphologically, chemically, and physiologically distinct. The medullary portion contains chromaffine cells related to the nervous system, while the cortex contains cells which stand in relation to certain cells of the sex glands. It is possible that in administering extracts or preparations of the suprarenal gland we have two distinct effects produced—one the result of a medullary substance which activates or stimulates the terminals of the sympathetic nerves. Most of the known action of the glandular extract can be attributed to this factor, including vasoconstriction, hyperglycemia or glycosuria (due to action on the sympathetics of the liver), pupilary reaction, and relaxation of the bronchi. Apart from this action, which may be directly chemical in nature, we have to consider the action of the cells of the cortex.

Animal experimentation is a rather uncertain index of the physiological effect of

adrenalin on the human being, as the results of its administration vary a great deal in different species; also the effect is subject to wide variation, depending on many factors, such as nerve depression, as by drugs, muscular relaxation, etc. For instance, adrenalin will cause a marked contraction in a vessel which is relaxed or dilated, while if the vessel is already in a state of good tone there will be little or no effect shown. A small dose may produce a result entirely different from that produced by a larger dose.

As is well known, in the human body adrenalin administered intravenously causes a marked but transient rise in blood-pressure due to contraction of the peripheral arteries. It does not, however, constrict the coronary arteries, but probably dilates them. Its effect on the heart depends on the activity of the vagus, and this is an important factor in determining the extent of the blood-pressure rise. The bronchi are markedly relaxed by its action, and peristalsis and digestive activity are decreased. The mobilization of sugar is increased with a resulting hyperglycemia or glycosuria. Cannon calls the service of the adrenal secretion to the organism an emergency function, increasing the efficiency of fatigued muscle and decreasing the clotting time of the blood. He also points out that strong emotional disturbances stimulate the discharge of epinephrin, continued worry leading to exhaustion and insufficiency of the gland.

In therapeutics its chief employment has been as a local vasoconstrictor, particularly in dealing with the membranes of the nose and throat. Injections of adrenalin have been found very useful in combating the vascular relaxation incident to shock, and while its action in this regard is very brief, it may prevent collapse in emergency. It is of value as a palliative measure in certain asthmatic affections, when an injection of from three to ten minims of the one-to-one-thousand solution either into a vein or deep in a muscle may terminate an attack almost immediately. While it gives prompt temporary relief in a number of these cases of bronchial asthma and of so-called cardiac asthma, it seems to have no permanent curative effect; but fortunately the susceptibility to the drug is not lost by repeated use, and increased dosage does not appear to be necessary. In antitoxin rashes, which are sometimes of serious moment, particularly if accompanied by edema of the glottis, it has been shown that an injection of adrenalin may altogether relieve the patient of symptoms within five or ten minutes. Here again the effect is not permanent and repeated doses may be necessary. I have seen acute circumscribed edema of the lip and of the tongue practically disappear within ten or fifteen minutes after the injection of ten minims of adrenalin solution into a vein on the back of the hand.

Adrenalin is recommended in the vomiting of pregnancy. Zuloaga has continued the administration of adrenalin in severe and otherwise uncontrollable vomiting from the second month of pregnancy to term, starting with ten drops every eight hours and later giving five drops every twelve hours, alternating with calcium. He is enthusiastic regarding this treatment.

Cavazzani has collected forty-seven cases in which a cure of osteomalacia is claimed to have been effected by systematic adrenalin treatment. He refers particularly to the assumption that deficient functioning of the adrenals interferes with normal skeletal growth, and discusses the question of etiology of rickets in this connection.

In the preparation termed adrenalin we have to deal with not only the chemical substance adrenalin or epinephrin, the product of the medullary cells, but also with an extract of the cortical cells, the nature and functions of which are totally distinct from those of the medullary portion of the gland. In some lower forms of life the so-called interrenal body, which corresponds to the cortex of the suprarenal gland in the higher animals, is indispensable to life, while the adrenal representing the medulla of the gland may be removed without fatal results. It is probable that in Addison's disease the destruction of the cortex is largely responsible for the condition, and also the cortex

may be in question in osteomalacia and rickets. In the matter of influencing growth and development of the skeletal tissues and of the sex glands, the cortex is probably more important than the chromaffine cells of the medulla.

Many writers have considered the question of a general myasthenia, distinct from but frequently confused with neurasthenia, which is due to adrenal insufficiency and which yields to organotherapy (thyroid, pituitary, and adrenal being recommended).

I have noticed patients showing various grades of general myasthenia, low blood-pressure, poor skin circulation, and slight pains which seemed referred to the heart, who seemed benefited by the dried adrenal gland administered by mouth; also the pituitary gland has seemed of service; but thyroid must in these cases be tried with great caution and carefully watched for bad effects.

In summarizing our present knowledge of the use of the adrenal gland as a therapeutic agent, it may be said that certain immediate and direct actions for which the medullary portion is responsible may be granted; on the other hand, there is probably an action due to cortical substances which has an effect on the nutrition of muscle and bone, and in certain diseases, as suggested, its effect may be sought by gland administration. In Addison's disease, where its use is theoretically indicated, the reports of success with adrenalin are not frequent or convincing.

Adrenalin is generally sold in one-to-one-thousand solution, which is reliable if fresh. It deteriorates rapidly, particularly if exposed to the light. The average dose is from five to ten minims of this solution injected well diluted into a vein or deeply into a muscle. The dried gland is also sold and seems to have a certain value when the cortical effect is desired.

The intravenous use of adrenalin is said to be contraindicated in organic heart lesions, nephritis, and arteriosclerosis. In animals it has been shown by Pearce that it is possible by large dosage to produce arterial degeneration, but its use in the ordinary dose subcutaneously has not to my knowledge been shown to be harmful, even when employed frequently and over long periods, as in cases of asthma.

THYROID.

Next to the adrenal, the thyroid is the gland of which we have the most knowledge chemically, though this knowledge is limited to very narrow boundaries. We know that iodine is a constituent of the gland and that in a measure its physiological activity corresponds to the amount of absorption of metabolized iodine. Iodine is held in combination with the colloid substance of the gland. Whether this combination forms a definite chemical substance is not established. Also the effect of this so-called iodothyrine in hyperthyroidism and Graves's disease is not thoroughly understood. Hyperplastic and hypertrophied glands contain as a rule less iodine than normal glands or colloid goitres. This does not mean, however, that less is present in the system, as the iodine content varies roughly with the amount of colloid substance, while the symptoms produced increase as the absorptive power due to the epithelial elements of the gland increases and with the power of taking up and metabolizing iodine, which seems greater as the epithelial cells are increased.

Different disorders due to variations in the gland are attributed to an excess or lack of combined iodine, and the excess of uncombined iodine in the system. Thus iodine poisoning bears a certain resemblance to thyroid disease. Iodine which has been found to be beneficial in endemic goitres is distinctly injurious in acute goitres of the hypertrophic type, giving many of the symptoms of Graves's disease, including gastric and intestinal derangements, tremor, emaciation, and muscular weakness. The administration of iodine subcutaneously, or by absorption from the skin, will markedly raise the iodine content of the thyroid gland. Administered by mouth its effect seems to be less marked.

Histologically, the normal thyroid gland is composed of acini lined with a layer of

epithelial cells. The acini are filled with a colloid substance. In a purely colloid goitre the acini are greatly enlarged, the cells flattened or atrophied, and the colloid greatly in excess.

In cases with a thyroid giving marked Graves's symptoms, we are apt to find a proliferation of the epithelial cells, and, instead of a single layer of lining cells, a thyroid adenoma with papillomatous outgrowths into the acini and proliferation of the lining layer. This overgrowth later tends toward atrophy. Thus in a patient with enlargement of the thyroid, even with exophthalmos and marked tremor, we may have to deal with a case of hypothyroidism, as truly as though we had a subject of myxedema or a cretin in question.

It is worthy of note that the hypertrophy of the gland may come on acutely and probably as a result of one of several influences. Intestinal intoxications, acute infections, certain mineral poisons, also strong emotional strain, all have been shown to be causative factors.

Thyroid activity may be checked by rest (bodily activity greatly augmenting the effect of the secretion); by *x*-ray treatment, which causes a rapid epithelial degeneration and atrophy; and most markedly, of course, by operative removal of a part or the whole of the gland. It is not, however, with this phase of the subject that we have to deal.

The size of the gland is no index of its symptomatic activity. We must remember that an enlarged gland need not mean an overactive gland, and that a relatively small gland may induce marked symptoms. The tendency of all goitres is toward resolution. It may be stated that the tendency of Graves's disease is toward spontaneous cure if the storm of symptoms may be weathered, that normal thyroidism will be reached, but that unfortunately the individual may not without aid weather the storm of symptoms; and further, if the normal point is reached, the condition does not remain stationary at the point of normal secretion, but the patient passes to a condition of hypothyroidism. Were this condition simple and uncomplicated it could easily be identified by the physician, but the bodily structures have suffered during the storm and the circulatory apparatus and nervous and muscular systems all show serious damage, causing symptoms and signs which obscure the picture.

Exophthalmos does not altogether disappear after it is once established. Tachycardia may persist from muscular weakness of the heart, caused by damage to the heart muscle, but the tremor, while it may be noticed, will, however, usually depend on muscular weakness and will disappear under conditions of more or less complete rest.

In considering the milder grades of hypothyroidism we find that signs vary greatly in the adult and in the young, and that there is a difference in appearance depending on whether or not the patient has previously suffered from severe hyperthyroidism which has left permanent damage.

In general, thyroid deficiency must be considered in cases showing mental apathy and muscular weakness with fatigue on slight exertion, particularly if there is no loss of weight. A dry skin and pale appearance point further in this direction. In adults particularly, an enlargement of the thyroid gland which has existed for some time is suggestive. There is faulty metabolism and the carbohydrate tolerance is increased. Albuminuria is frequent. Obesity does not occur with any degree of constancy. Indeed, many extremely thin subjects will be noted, particularly when the hypothyrosis is the result of exhaustion of the gland by a chronic infection or intoxication.

There is reason to believe that in a hypothyrosis there is a deposit of a mucin-like substance, a product of tissue degeneration in all the structures of the body. These deposits of foreign material in the muscle fibers of the heart, in the kidneys and liver, and in the brain and nerves, give rise to a variety of symptoms which may be accounted for on purely mechanical grounds.

Skin affections are very common, as might be expected, the mucin deposits mak-

ing the blood and lymph supply of the skin insufficient and preventing the action of the sebaceous follicles.

The heart's action may be seriously interfered with and the intestinal tract hampered in its action, producing the digestive symptoms which frequently form such a marked feature of this condition. Kidney disturbance has been accounted for by the same theory. Various neuralgic pains and so-called myositis, also migraine, are encountered in hypothyroid subjects, which yield promptly to thyroid therapy, and which seem explicable on these grounds. By direct observation of the bladder and ureters it has been shown that the administration of thyroid extract has a marked effect in combating congestion of the bladder wall and urethral orifices.

In the young we note occasionally extremely nervous subjects of faulty mental and physical development who are benefited wonderfully by thyroid administrations. Extreme diffidence or sulkiness may be the most marked feature of their condition, or an exaggerated nervousness and almost choreic appearance. Sexual development is delayed. It must be admitted that not all of these symptoms can be established as due primarily to thyroid deficiency, but deficiency in one gland influences other secretions and metabolic activities, and we are describing here a type of case which is favorably influenced by thyroid administration. The use of iodine in inorganic combination does not have a parallel effect, while thyroid medication may influence very strikingly the growth, muscular strength, development, and mental capacity. Attention was called by Thompson to the good results following the treatment by thyroid gland in a series of cases of enuresis in children. Following this suggestion, I have noted not only a clearing up of this disagreeable symptom but a remarkable improvement in the general physical and mental condition in several cases.

A case in point is that of a girl of seventeen, referred by a neurologist on account of constant and distressing headaches, general poor health, and menstrual difficulties. This girl was so nervous that it was difficult for her to talk to strangers without attacks of weeping. Menstruation was extremely irregular and accompanied by great mental depression. Enuresis had been frequent for years, and headaches of severe degree were almost a daily occurrence. The use of thyroid in this case was suggested only by the symptoms of enuresis. Not only was this symptom cleared up, but the headaches ceased, and she rapidly improved in her nervous and mental condition to such an extent that she was able to take a business position after completing her studies as a stenographer. I had her under observation for about three years, during all of which time she was more or less dependent on thyroid medication.

In summarizing the condition in which thyroid extract has been credited as an efficient therapeutic agent, we find an alarmingly long list of diseases and symptoms, but the following demand attention, either through the number of reports of success or by reason of the reputation of the clinician advocating the treatment:

Chronic skin diseases, particularly eczema, psoriasis, and alopecia.

Certain cases of chronic arthritis. Delayed union after fracture.

Anemia, particularly of the chlorotic type, in young women and particularly if associated with metrorrhagia.

Albuminuria, especially of the orthostatic variety, and in the young.

Enuresis in children.

Menorrhagia. Habitual abortion.

Various mental and nervous conditions, particularly where apathy and depression are marked and where somnolence is a feature. Melancholia, migraine, various neuralgias.

The possibility of thyroid exhaustion and deficiency may be considered in cases showing a chronic enlargement of the gland, or presenting evidence of long-continued infection or intoxication. It must be looked for at some period in most cases of recovery from Graves's disease. The indiscriminate use of thyroid preparations as a treatment for obesity is certainly inadvisable, but the

carefully observed administration in the obese subjects will frequently be found to be beneficial.

In thyroid therapy certain rules should be observed, the chief of which is to always start with small doses, and, save in very exceptional cases, to continue with small doses. One-quarter to one-half grain of the dried gland three times daily is a sufficient dose to begin with, and the latter amount may be too large. One effect of thyroid administration is to liberate rapidly from all the tissues the deposits of mucin-like material, and the toxic effect of this flood may be serious if not accomplished gradually. This effect is often mistaken for hyperthyroidism, resulting primarily from the gland administration. The central nervous system and the heart may be seriously affected by this toxic action and the kidneys placed under a severe and sudden strain. As Leonard Williams emphasizes, the greater the need of thyroid extract, the greater the danger in large dosage. Calcium is frequently indicated in connection with thyroid therapy. Children tolerate thyroid well.

The signs of overdosage are easily identified. Tachycardia, flushing, tremor, nervousness, insomnia, and diarrhea are the chief ones. It might be well to say that if after a brief trial of thyroid, carefully administered and closely observed, good results are not apparent, its use should be discontinued. As far as we know its bad results are readily noted, so that a careful and judicious trial of this treatment cannot be said to be contraindicated in any case in which it appears that it might be of value. Patients will be found in whom a hypothyrosis is temporary and in whom treatment may be discontinued. This is particularly so in the young, but in many cases, of course, occasional or continued medication may be required for years.

Thyroid therapy has, I think, been rather generally neglected. In certain suitable cases the favorable results obtained are so striking and so nearly impossible of attainment by other methods that a wider field of experimentation with these preparations should be covered by the practicing physician.

PARATHYROIDS.

The parathyroid glands are small epithelial structures lying in close proximity to the thyroid. They are usually four in number, but accessory glands may be present in different parts of the neck or embedded in the thyroid or thymus tissue.

Their removal results in a prompt onset of general tetany. Their partial destruction causes a condition of latent tetany, which may be chronic and partial as indicated by spastic tendency, or may not become frank until some other condition, such as pregnancy or some physical disorder, supervenes.

The view was accepted for a time that the removal of the parathyroids increased the calcium output and thus decreased the calcium content of the blood and tissues, but this view is now denied by many.

That the calcium metabolism is disturbed in some way is likely, and it is well known that the administration of calcium to patients suffering from tetany will control the symptoms. Other mineral salts, particularly magnesium, are said to accomplish the same result.

The parathyroid is said to have an exciting or stimulating effect on the secretion of the pancreas, an action opposed to that of the thyroid, which depresses the pancreas.

Extracts and preparations of the parathyroid glands have for a number of years been used in tetany and also in paralysis agitans. It is doubtful whether any good results are obtained which could not be produced in a simpler manner by the use of calcium.

The removal or destruction of the parathyroid glands seems to result in an increased excitability of the muscular mechanism of the body. This condition may be controlled to a certain extent by the administration of the gland, or probably more satisfactorily by simple calcium therapy.

Satisfactory evidence is lacking regarding the influence of these glands on growth and development.

HYPOPHYSIS.

The functions of the hypophysis have of recent years been the subject of an immense amount of research, and some few facts seem to be definitely established.

Like the suprarenal gland, the hypophysis consists of two principal parts, differing in their derivation and function. The anterior lobe, or pituitary gland, is an epithelial structure, while the posterior lobe is an outgrowth of the third ventricle and consists principally of nervous tissue. The fact of there being an active internal secretion is well established. There may also be an external secretion into the third ventricle having a direct effect on the central nervous system. So little is known regarding the physiology of the third portion, the pars intermedia, that a discussion of this subject will not be undertaken. Important facts noted regarding the effect of the gland on development and growth have been the association between changes in the hypophysis and acromegaly, which condition seems to be due to overactivity of the gland in adult life; a connection between the overactivity of the gland in early life and gigantism or overgrowth of the long bones; and a relation between insufficient function of the gland and the condition described by Froelich as dystrophia adiposogenitalis. In certain cases of dwarfism, the anterior lobe of the hypophysis is said to be destroyed. There is a very close connection between the hypophysis and growth, especially of cartilage and bone, also between the hypophysis and other glands of internal secretion, especially the thyroid and the sex glands. Changes in the hypophysis seem to have a direct effect on carbohydrate metabolism. With insufficient glandular activity there is a marked retardation of growth and retention of infantile characteristics. It is impossible to say how much of this effect is due directly to the hypophysis, and how much of it results from interference with other glands.

It has long been considered that there is an action between disorders of the pituitary body and diabetes insipidus. This is probably not the case except in so far as growths of the hypophysis cause pressure and disturbance to the base of the brain and the floor of the third ventricle.

Like the suprarenal body, the hypophysis contains two principal portions functionally distinct. With the adrenal it is practically impossible to separate the two portions of the gland, and extracts of the whole gland must be employed. With the hypophysis, on the other hand, the lobes are easily separated, and preparations of the whole gland, or of either the anterior or posterior portions, are available.

The action on growth and development seems to depend largely upon the anterior portion, while the immediate effect upon the blood-vessels and smooth muscle appears to result from the activity of the posterior substance. Commercial pituitrin is the extract of the posterior lobe put up in liquid form. The whole gland is available in dried form, and these products seem to be reliable. The use of these products is becoming very generally recognized.

In pituitrin, used hypodermically, we have a potent weapon against shock and collapse. Its effect on vasomotor tone is very satisfactory in conditions of circulatory paresis. In many ways it seems the most satisfactory drug available in emergencies, such as pneumonia, erysipelas, and other acute infections, and following operations. The direct effect upon the heart tone seems to be favorable.

As a stimulant to the smooth muscle structures it acts promptly, which accounts for the favor it enjoys amongst obstetricians, who accord it a place above ergot in furthering contractions of the uterus. In asthenic conditions with paresis of the bowel and otherwise uncontrollable distention, an injection of pituitrin may be followed within a few moments by a regaining of intestinal tone and expulsion of quantities of flatus. It appears to have a pronounced effect as a diuretic and is much used for this purpose. A great deal of experimental work has thus far failed to satisfactorily establish the mechanism of this action. There is probably some effect apart from the increase in blood-pressure.

Pituitary gland is said to have a favorable action in uterine atony, uterine hemorrhage, and in various chronic non-inflammatory gynecologic infections. The treatment here seems to result in a lessening of pelvic congestion, depending on improved vessel tone, muscle tone, and possibly on a resulting change of ovarian activity, as the hypophysis seems to exercise a definite influence on the activity of the sex glands.

Among the conditions for which extracts of the hypophysis have been recommended is acromegaly, in which the whole gland is preferred; the effect in this condition probably being due to the anterior portion, or the true pituitary. A number of cases have been reported in which results were favorable, using from six to twelve grains daily of the dried gland. There are probably many cases showing a mild degree of hypoactivity of the pituitary which can be benefited by a gland administration. These cases are apt to show an increased carbohydrate tolerance, and, in fact, it is claimed that the proper dosage may be determined by testing for alimentary glycosuria after the giving of dextrose or levulose in the amount which should cause glycosuria in a normal individual of the same body weight, decreasing the dose causing a cessation of the glycosuria, while increasing the dose of hypophysis causes sugar again to appear in the urine. In cases of dystrophia adiposogenitalis, improvement in condition has not been as marked as in cases of acromegaly. This seems natural, as the developmental faults are of earlier origin, and normal growth in these cases has never been reached, while in the acromegalic the condition is of later life and is implanted on a normally developed body.

It is not unusual to find girls or young women of faulty development with a marked uterine atony and a troublesome discharge, which seems due to muscular relaxation, and in whom the administration of the dried gland in a dose of about four to six grains daily is followed by a prompt improvement.

I recently saw a child of fourteen in whom the onset of menstruation was followed by a troublesome metrorrhagia, this having lasted for twelve weeks. The girl was intensely anemic and very weak. After two days of pituitary treatment the bleeding had practically stopped. On discontinuing the gland administration there was a return of the trouble, though not as severe as before. On resuming the treatment there was again a prompt cessation of the bleeding. Since the second brief course of treatment her periods have established themselves regularly and the metrorrhagia has entirely disappeared. She has had no other medication. She is now comparatively strong and her appearance excellent.

Pituitrin has been said to be an active galactagogue, but experiments have shown that this apparent action is caused by muscular contraction of the ducts causing a discharge of milk, but that there is no increased secretion.

It has been recommended in osteomalacia, although the reports of its use do not show as much evidence of favorable action as do those of suprarenal medication. In shock it may be combined with epinephrin, the resulting increase of blood-pressure being better sustained than when either is used alone. In pulmonary hemorrhage it seems theoretically indicated, since, as has been shown by Wiggers, it raises the general blood-pressure but causes no rise of pressure in the pulmonary circuit.

The pituitary gland is recommended in angioneurotic edema, urticaria, and asthma, also in hyperthyroidism.

On the whole, it may be said that pituitrin, the extract of the posterior lobe, is useful in emergencies in certain conditions, being one of the most valuable of agents at our command for temporary use. No conditions, however, appear where its continued employment seems advisable. The extract of the whole gland, on the other hand, containing the anterior portion, seems to have certain effects which render it useful in conditions of general faulty development and poor bodily tone.

Regarding the dangers of the use of pituitrin, many bad results have been reported from its use in obstetrical practice;

rupture of the uterus having occurred a number of times from its injudicious employment. As with any potent instrument, it must be used with judgment and common sense. I have had no experience with this phase of its employment, but the opinion of obstetricians familiar with its use seems to indicate that it is, if properly used, no more dangerous than ergot, and much more prompt in its action; the use of small doses by mouth seems to be without bad effect. Musser has tested the effect of continuous administration of the gland on a number of normal individuals, and finds the only consistent effect to be a distinct rise in blood-pressure. Large doses may cause diarrhea and gastric disturbances. The extract of the posterior lobe is conveniently put up in ampoules for subcutaneous use. Ten to fifteen minums, injected in a muscle, is the usual dose. One cubic centimeter of pituitrin corresponds to one-tenth of a gramme of the posterior lobe. The dried gland may be employed by mouth in doses of from three to six or eight grains daily. In acromegaly it is recommended in slightly heavier doses.

THE SEX GLANDS.

The ovary and testicle contain cells of two distinct types—those forming the gland structure proper and the so-called interstitial cells.

It appears conclusively established that the essential elements for influence on growth and metabolism lie in the interstitial cells; at least in the testicle is this the case. In the ovary experimental work is less conclusive on this point, though the substance of the corpus luteum has been shown to have a very definite effect on the uterus, and indeed the corpus luteum may be considered as a gland of internal secretion.

It seems peculiar that while the results of experimental work are more conclusive in showing the effect of testicular extracts on bodily growth, and in showing a distinct relation between the activity of internal secretions of the testicle and the function of other internal secretions, notably those of the thymus, pituitary, and thyroid, clinically the ovarian preparations are much more widely used.

Regarding testicular extracts, the experiences of earlier years, when experimentation along these lines seemed much in vogue, have resulted in nothing of value. The use of ovarian preparations, however, is said by many observers to be effective; especially substances derived from the corpus luteum are at the present day enjoying favor. Favorable results are reported by so many men of eminent standing that it appears impossible to deny the efficacy of ovarian substance as a therapeutic agent. Its principal uses seem to be in combating the disagreeable results of the menopause, both when it occurs naturally and when it is premature following operation, and in cases of genital hypoplasia and anemia in girls and young women. Many other uses are suggested by various authors, but reports of benefit are either few in number or not convincing.

The importance of having reliable extracts or preparations, and of careful supervision and graduation of dosage, must be emphasized. The corpus luteum preparations, and particularly those from the pregnant animal, seem the most potent. The dose recommended is from two to eight grains of the corpus luteum dried substance three times daily.

It is said at times to produce headache, vertigo, and other disagreeable symptoms, and to lower the blood-pressure if used continuously or in large doses. The effect should be carefully watched.

Most of the experience with this preparation is reported by gynecologists. Personally my experience has been limited, and I have not been able to assure myself of any certain results in the cases in which I have tried this agent.

THE THYMUS GLAND.

The thymus gland is of epithelial derivation, but added to it in its development are masses of small cells resembling lymphocytes, the true nature of which is undetermined. The thymus gland is of great im-

portance in controlling bodily growth and development.

The removal of the thymus seems to interfere with the calcification of bone and often to cause a softening of bone already formed, the bone changes resembling, more or less, those of rickets.

The recent experiments of Gudernatsch are very suggestive. He fed tadpoles upon thymus gland and also upon thyroid. He finds that the thymus cases a great increase in size and a prolongation of the periods of growth without mature development, while the thyroid, on the other hand, causes a rapid change to the mature form, but a retardation of growth.

In castrated animals the thymus is much larger than in the normal, and in young animals in which the thymus has been removed the growth of the testicle is more rapid than normal. Persistent enlarged thymus occurs in the so-called status thymico-lymphaticus. In infants it may have a direct mechanical influence by pressure in producing sudden death.

In children of an older growth the presence of the gland itself has not been shown to be significant in causing the sudden death which is so apt to occur in this condition. There is probably present here a general disturbance of the glands.

The practical use of preparations of thymus gland in therapeutics has been rather limited. The only condition in which favorable results seem to be reasonably established are certain types of osteo-arthritis, where its influence seems good, and in rickets, in which also good results have been reported by a few observers. This gland is prepared in dry form, in tablets representing five grains of the fresh gland, and is recommended in dose of two or three tablets three times a day. Prolonged administration is said to be necessary to achieve any result in arthritic conditions.

Very little is known regarding the function of this gland. Conclusions regarding its physiological function are so meager that there is really at present no satisfactory basis for its use, except in the conditions above stated.

THE PINEAL BODY.

The pineal gland must be mentioned. Experimental work showing a profound effect on growth and bodily development is so striking that we must look for most interesting developments in the near future.

McCord concludes that feeding young animals on pineal tissue results in precocious bodily development, which, while rapid, does not proceed beyond normal limits, and also in precocity of mental and sexual attributes.

THE DIGESTIVE TRACT.

The pancreas seems to have an internal secretion which affects the liver and the digestive processes. Pancreatin, the dried external secretion of the pancreas, has been largely employed for years. It is advocated as a digestant. Whether it contains the active principle of the internal secretion in addition to its digestive enzymes is not known.

The intestinal mucosa is supposed also to elaborate an internal secretion and has been employed experimentally.

* * *

In conclusion it may be repeated that in the opinion of the writer the therapeutic use of the glandular products has not been sufficiently general. Careful observation will show many individuals in whom organotherapy offers valuable aid. A history of overactivity of a gland in the past may furnish the clue leading to the discovery of insufficient function at the present time, or the physical stigmata associated with glandular disorders may point the way. Frequently faulty and abnormal physical development gives us a clue, and the experimental employment of glandular therapy is surprisingly successful.

As has been previously remarked, these questions must be solved by workers in the great laboratory of general practice, and the reports of the next two or three years will

give us a much clearer view-point in regarding this subject which now looks so promising.

In judging the value of reports of marked benefit resulting from the use of certain therapeutic agents, we have learned to discount the value of the judgment of the unreasonable enthusiast. We suspect unconscious bias also, where reports emanate from or are circulated by those who are financially interested in the sale of the remedy discussed. We must, however, give due credit to certain firms, both in this country and abroad, for fair-minded and valuable research in this particular line.

The amount of recent literature on this subject is too stupendous to attempt to list even the most important articles, but mention must be made of the works of Biedl and of Vincent Swale. A most interesting and well-written book, giving in small space a well-rounded résumé of the physiological work up to the current year, is Noell Paton's "Regulators of Metabolism."

The works of Cannon and of others on the adrenal function, also the writings of Hoskins, should be referred to.

Stimulus given to experimentation in these lines by the theories and writings of Sajous must also be mentioned. Reid Hunt in "Forchheimer's Therapeusis of Internal Diseases," edited by Billings and published this year, gives an excellent summary of organotherapeutics.

255 South Sixteenth Street.

THE TREATMENT OF IMPERFECTLY DESCENDED TESTICLES.

Corner in the *Clinical Journal* of December 9, 1914, tells us that the treatment of imperfectly descended testicles can be summed up as follows from the point of view of the age of the patient:

At birth and up to the age of about five years watch the case to decide if the testicle is merely late in its descent or not. If hernia is seen to be present, operate and conclude by doing an orchidoplasty.

From seven to twenty years of age, operate if a hernia is present or not. Do either an orchidoplasty, an orchidectomy, or an orchidocelioplasty.

Between the ages of five and seven the line of treatment must be judged by the condition of the patient as well as the condition of the gland. Many a patient is older in years than he is in general bodily development. It can therefore be estimated into which clinical class he will fall.

Above twenty years of age, do an orchidectomy.

There is another point which further experience has taught the writer. In his book on the "Male Diseases of General Practice," Oxford Medical Publications, pp. 95 to 97, the subject of the "masked imperfect descent of the testicle" is considered, the writer believes for the first time. Shortly, the imperfect descent of the testicle is masked if the hernia which accompanies it pushes the testicle down into the scrotum. Such a condition of imperfect descent is not recognized or recognizable until the hernia sac is fully stripped up and removed, and the radical cure done. The testicle then assumes the position of imperfect descent or something near it. Since the publication of that book, in 1910, the writer has met many examples of this condition, and he is sure that it is a great deal more frequent than he formerly supposed. Such a conclusion supports in detail Mr. Hamilton Russell's theory that every hernia depends for its cause on a congenital fault. Such a congenital fault with the tunica vaginalis is likely to be accompanied by some fault in the descent of the testicle. To state the case briefly, whenever a hernia is produced through a congenital fault, it is likely that the hernial fault is accompanied by another in the descent of the testicle. The accompanying testicular fault may be hidden by the hernia pushing the testicle scrotumward. Thus the testicular anomaly will not be recognized until the sac of the hernia has been divided and removed. These cases the writer finds suitable for a scrotal orchidopexy, the operation-adhesion bearing a similar relation to the testicular descent as the stick to the correct growth of the scarlet runner.

EDITORIAL.

DOSAGE AND EFFECTIVENESS.

No one can practice medicine for more than a very brief period without becoming convinced that quite as much skill is required on the part of the practitioner in determining the dose which is needed of a given remedy as in deciding upon the remedy itself. It repeatedly happens that one physician fails to produce the desired results, while another physician, to whom the patient goes in despair, immediately gets good effects from the same remedy, for no other reason than that he has been more skilful in determining the amount which should be administered and the frequency of the administration.

In teaching medical students the dose of remedies it is impossible to do more than inform them of the approximate doses. Only experience can tell the individual physician the amount which will be needed in a given case, and often even those with the largest experience have to try several doses before they find the one which produces the effects they desire. These facts have much to do with the contradictory ideas which exist in different men's minds as to the efficiency of a given remedy. One physician states that he frequently employs a certain drug and has come to rely upon it as a "sheet-anchor" when conditions are desperate; another physician replies that he has tried it, and that his results have been as lacking in success as the other's have been full of good. This difference of opinion does not rest upon any lack of power of observation on the part of either man, but upon the judgment of each as to the amount of the remedy to be used. If there were more accurate statements made as to the doses employed when remedies are suggested by one practitioner to another better results would accrue.

It is also probably the case that certain physicians consistently administer remedies in doses which are too large, or which speedily become too large because the drug is one which is persistent in its effect, so that after a few doses the patient is not only under the influence of the remedy administered on that particular day, but also under the influence of doses which have been administered on previous days. Then there is the physician who habitually uses too small doses, and it may be that in a large number of cases he is a better practitioner than he who gives the large ones. Sometimes rapidly acting, but fugacious, remedies are given at too long intervals, or doses of slow acting, persistent remedies are given too close together; and, again, sufficient judgment is not exercised in determining exactly what is to be accomplished in a given patient at a given time. Thus, in the administration of digitalis it is often wise to give one or two rather large doses, and almost always unwise to continue them; the proper method being to correct urgent symptoms by large doses and then maintain the good effect by smaller ones, thereby preventing an excessive digitalis effect, which may be more disagreeable or harmful to the patient than the condition for which the remedy is administered.

Another illustration of this is in the administration of alkalies for the purpose of combating the acidosis which induces or accompanies diabetic coma. It is generally known that sodium carbonate and sodium bicarbonate are to be given by rectal injection or by intravenous infusion in order to, at least in part, combat these acids which ultimately form acetone, but in many instances the quantity of alkali which is given is quite insufficient to produce the results desired, because the physician does not estimate the degree of the acidosis. It is not at all uncommon for these acids to amount to as much as 10 or 20 grammes in the twenty-four hours, and many instances are on record in which several times this quantity has appeared in the urine, which is an index of the total acidosis of the body. Manifestly different doses of alkali have to be used in such cases, and sometimes, instead of giving as much as a drachm, or four grammes, it is proper to give as much as three or four

ounces of sodium bicarbonate in each twenty-four hours. Cases are on record in which as much as 900 grammes, or 30 ounces, of sodium bicarbonate have been administered without neutralizing the urine. In other words, in this condition the alkali should be given for effect and not by weight, the principle governing its administration being more akin to the employment of an antidote in mineral poisoning, or the use of antitoxin in diphtheria, rather than to the adjustment of the dose of a drug ordinarily employed for the purpose of producing a physiological effect.

PITUITRIN AS A CARDIAC REMEDY.

The attention of the medical profession has been so centered upon the extraordinary influence which pituitrin is capable of exercising upon the parturient uterus that comparatively little attention has been paid to its usefulness in other conditions, although it has been known, ever since pituitrin was first introduced, that it was capable of exercising a very definite influence upon the circulatory apparatus, an influence which differs from that of adrenalin rather in degree than in kind. It is interesting to note that its circulatory effects are now being brought forward from a clinical standpoint, its physiological action upon animals having been well proved.

Zueblin has recently reported his experience with this remedy in the treatment of failing heart due to acute infection and also ruptured compensation arising from permanent heart lesions. He reports seven cases of cardiovascular disease in which he employed pituitrin and gives a full discussion of the investigations of others upon the physiological action of this drug in animals and man. Zueblin is quite well aware that his experiences have not been sufficiently diversified to justify him in reaching very definite and positive conclusions, but the fact that all of his seven cases were serious and that only two terminated fatally leads him to believe that the use of pituitrin as a cardiac stimulant deserves further investigation on his part and that of other practitioners, the more so as both of his fatal cases were in a desperate state, advanced in age, with degenerative changes in the blood-vessels and kidneys. He believes that too free use of pituitrin in cases of marked arteriocapillary fibrosis may result in a sudden harmful rise of pressure; a rise harmful not only because it puts additional stress upon the vessels, but because there is more strain placed upon the myocardium. We think that these dangers are to a considerable extent exaggerated since simultaneously with the rise in blood-pressure there must be also a stimulation of the heart muscle. If the heart muscle has undergone such an extreme degree of degeneration that pituitrin is unable to stimulate it, it is highly probable, almost certain, that an equal degree of degeneration has taken place in the muscular fibers of the blood-vessels, and therefore no extra strain will be thrown upon the heart.

The dose which he employed consisted of one ampoule of pituitrin—in other words, a cubic centimeter injected subcutaneously, to meet marked evidences of circulatory failure. The pituitrin was followed by a 10-minim dose of tincture of digitalis three times a day. In some instances a dose of pituitrin was given on several consecutive days. He found that its employment did not always raise the blood-pressure; indeed, it sometimes seemed to somewhat lower it. In other instances, however, when the blood-pressure was already abnormally low, pituitrin was effective in raising it. Thus in one case of acute endocarditis, with dilatation of the heart and serous pleurisy, the systolic blood-pressure before pituitrin was used was 90 and the diastolic pressure 60. Two hours after the injection the systolic pressure was 110 and the diastolic 90, and twenty-four hours later this pressure was maintained, the patient's general condition was better, and the area of cardiac dulness was materially diminished.

In concluding his paper he speaks also of the value of pituitrin in overcoming tympanites, which is uncontrollable by any other means, the drug being given hypodermically and usually giving relief within a few hours.

THE LIMITED VALUE OF ANTIPYRETIC DRUGS.

For many years medical men were wont to think of fever as a disease instead of recognizing that it was a mere symptom of disease, and it is not surprising that, laboring under this delusion, they regarded it in all instances as something serious and harmful to the patient. Unable to materially modify or alter the course of ordinary fevers they struggled against their impotence and attempted in different ways to cause a fall in temperature, thinking when they were successful that they had triumphed over the malady and certainly never appreciating the fact that, in a large proportion of cases, fever is not only a sign-board which provides the physician with information as to the condition of his patient, but, more important still, is designed by nature to enable the body to combat the infectious process. It is not surprising, therefore, that when the earlier antipyretics were introduced the profession accepted them with enthusiasm, and employed them not only constantly but often in doses which were considerably larger than those which are considered adequate at the present time. The introduction of these early antipyretics was practically simultaneous with the full development of our conception that infectious diseases were due to microörganisms, and within a very few years the pandemic of epidemic influenza swept over the world and so provided thousands of patients in whom the antipyretic drugs seemed to exercise a useful effect, in that they lowered the temperature, and by their pain-relieving properties diminished the aching in the back and in the limbs which is so characteristic of this disease. After the first great pandemic occurred a large number of cases were reported in which evil, or untoward, effects of the antipyretics developed, and these reports caused a good many physicians to become more cautious in their use of these drugs.

As our ideas concerning the methods by which the body protects itself from the invasion of microörganisms became clarified, it began to dawn upon many persons that fever, by raising the temperature of the body, possibly makes it a less favorable site for the growth of disease germs, materially aids it in the development of its protective processes, and facilitates the destruction of poisons which these germs directly or indirectly produce or induce.

At the present time some practitioners undoubtedly have an exaggerated idea of the degree to which these so-called antipyretic drugs are capable of depressing the circulatory and nervous system. Possibly this is advantageous in that it makes them cautious in the administration of these remedies, but it would be much better if they were cautious because they recognized that as a rule they are useless or harmful, so far as the infection is concerned, rather than that their hand is stayed by a fear of cardiac depression. In other words, it is better to be cautious for a real reason than to be cautious for an imaginary one.

While it may be truthfully stated that antipyretic drugs have so limited a range of usefulness that the best practitioners ignore them, it can be stated not only with truth but with emphasis that there are certain types of fever in which they rarely if ever act well, and often produce a condition which is more uncomfortable to the patient and more deleterious than if they had not been administered. These fevers are those which are characterized by feebleness—notably typhoid fever among the acute infections and pulmonary tuberculosis among the chronic infections. Be the administration of the antipyretic drug never so skilful during the course of typhoid fever, nevertheless the disease proceeds uninfluenced to its end, although the sign-board, fever, may be temporarily twisted about or knocked down. In tuberculosis practically all the antipyretics, if given in doses which are adequate to lower the temperature, increase sweating and cause a sensation of depression or weakness, and if the pulmonary lesions are severe they further induce lividity and cyanosis, often accompanied by such profuse sweats that the patient seems almost in collapse.

In the short-lived, acute infectious dis-

eases, like measles and scarlet fever, the fever rarely rises to a point which is dangerous in itself, and lasts for so short a time that it does not do much harm. During the febrile days a battle royal is being waged between the invading microörganisms and the protective processes of the body. No one who reads one of the modern books, dealing with infection and immunity, containing descriptions of the various measures adopted by the body for combating infection can fail to be impressed with the fact that to give an antipyretic drug in the presence of acute infection is equivalent to administering a remedy of which he knows little to a body of which he knows less. It has always seemed to us, as we have watched the development of the science of immunity, that the physician who gives an antipyretic drug to relieve fever, except under extraordinary circumstances, is not only interfering, in all probability, with a function designed by nature to be useful, but is also doing little better than the mischievous boy who drops grains of sand in the works of a fine chronometer. Rarely does he drop the sand with a full conception of the damage that he will induce, and it may be truly said that the physician who uses these drugs may plead that he is in ignorance of the harm which he may do; but in the case of the boy the ignorance of youth is at least in part an excuse, whereas in the case of the physician, if ignorance exists, it is because he has not kept himself abreast of modern advances in the science of immunology and the protective processes of the body.

It must be borne in mind that the human body to-day not only represents the survival of the fittest, but that it also represents the development of those processes which have been produced in its fight against disease through thousands of years. So far we have stood only upon the threshold of that room which contains the secret methods by which we can stimulate the protective processes and aid nature, but standing as we do upon that threshold and looking into that room, which will eventually reveal so much as investigation proceeds, let us not step back into the outer darkness, through which with groping hands we have won our way to the door of what is still mysterious. It behooves us, now that we are no longer ignorant of the harm which we may do, to bear in mind that most essential qualification of a good physician, that in attempting to do good he must avoid doing harm.

It is an interesting fact that the laity, who have gotten a glimpse into the mysterious chamber of immunity, through a much narrower opening than that through which medical men have looked, are beginning to realize that medicines can do harm as well as good and often criticize the physician who gives too much medicine, or else rightly or wrongly attributes symptoms, which may ultimately develop, to the effect of the medicines which have been used. In some instances this results in great injustice to the physician, but in other instances it is not unjust. Where the physician is placed on his guard, by this feeling on the part of the laity, he can the more readily resist the temptation to administer a remedy, at least until by careful thought and mental analysis he concludes that the reasons for giving it are far in excess, both as to numbers and importance, of those which can be marshalled against its employment.

We cannot help believing that these facts are particularly true when they are applied to the so-called antipyretic drugs, which certainly ought never to be used unless the physician is confident that he can successfully defend their use if challenged to do so by a jury of his peers.

EMPYEMA OF THE NASAL AND ACCESSORY SINUSES.

Although the prevalence of nasal and postnasal catarrh in its various manifestations is commonly recognized, the fact that a comparatively large percentage of patients thus afflicted have purulent accumulations in their accessory nasal sinuses with the persistent local and systemic effects produced by such accumulations is either un-

known or ignored. Tilley states that at least 7 per cent of the entire population suffer from some affection of these sinuses, the resulting systemic symptoms being those of a chronic toxemia with a lessened resistance to disease.

Lewis (*Saint Paul Medical Journal*, February, 1915) divides the accessory sinuses into two groups, the anterior and posterior. The anterior group comprises the frontal, anterior ethmoidal, and maxillary sinuses, which drain beneath the middle turbinate body into the middle meatus; while the posterior group, the posterior ethmoids and sphenoid, empty their secretions into the superior meatus, which reach the lower nasal cavity by way of the olfactory cleft. Hence the explanation of purulent conditions of the frontal or ethmoidal sinuses bringing about the same condition of the maxillary sinus, or empyema of the sphenoidal sinus being followed by a like condition of the posterior ethmoids.

Deformity of the middle turbinate, especially when complicated by deviated septum and enlarged ethmoidal bulla or unciform process, may interfere with drainage and aeration of the anterior group when mucosal swelling occurs. Anatomical variations do not so markedly influence the posterior sinuses since their ostia are located in the superior meatus, where swelling of the overlying structures offers little obstruction to the escape of secretions. Any severe primary intranasal infection when neglected may readily result in sinus empyema.

As to the maxillary sinus disease the teeth are responsible for a small percentage. Probably purulent infection in the frontal or ethmoidal sinuses is the usual causative factor.

A normal sinus is germ-free, incident to the motion of the mucosal cilia plus an increased and bactericidal secretion. In cases of infection bacteria are rarely found in pure culture, as many as five different organisms having been isolated from a single specimen. The organisms commonly responsible are staphylococci and streptococci.

The *x*-ray is of incalculable value in examination of the anterior sinuses—not so useful in conditions affecting the posterior ones. These pictures are most serviceable in determining the mucosal and periosteal changes in the sinuses; they do not enable us to distinguish between inflammatory conditions, fluids, and new growths, nor will they indicate the presence of pus.

The subjective symptoms are usually headache, which in the acute cases is as a rule diurnal, worse in the morning and subsiding in the afternoon or evening. In chronic cases headache may be constant or entirely absent, but in the latter case anosmia, cacosmia, and ozena are common symptoms of the chronic type. A purulent toxemia, expressing itself as a profound neurasthenia, is at times the only subjective symptom.

The objective symptoms are rarely characteristic of involvement of a particular sinus and never pathognomonic. In fact empyemas are not usually confined to a single sinus for the reason that the cavities are quite closely correlated physiologically and anatomically.

The presence of pus or muco-pus in any part of the upper air-passages is incontrovertible evidence that at least one of the sinuses has become infected. After the application of cocaine and adrenalin it may be determined whether the pus lies in the superior or middle meatus and the source may be traced. Suction and injection of hydrogen peroxide are both useful, whilst transillumination is a helpful diagnostic means in empyema of the frontal or maxillary sinuses. Presence or absence of fluid in the maxillary sinus may be determined by puncture of its nasal wall. A similar diagnostic opening may be made near the floor of the sphenoid sinus with a small drill. Necrosis suggests lues.

As complications and sequelæ of sinusitis there are swelling of the upper eyelid, postbulbar cellulitis or abscess, partial or complete optic neuritis, unilateral exophthalmos, epidural or cerebral abscess, leptomeningitis, cavernous sinus thrombosis, and thrombophlebitis.

The fundamental object of therapy is to

insure drainage and adequate ventilation of the cavities and to remove the diseased parts with a minimum sacrifice of tissues and avoidance of performing disfiguring operations. Acute cases usually respond to medicinal agents and minor procedures. Sodium iodide to increase the secretions and aspirin for pain are both useful. Rest with a minimum of exercise should be enforced. Beginning with the application of cocaine and adrenalin to the anterior portion of the middle turbinate, negative pressure in the nasal chamber may be tried as a means of encouraging drainage. If this fail the middle turbinate is broken inward by spreading a Killian speculum introduced between the anterior portion of the middle turbinate and lateral wall. If the turbinate be greatly enlarged or a deviated septum present, this can only be overcome by removing the anterior portion of the middle turbinate or correcting the narrowed nasal chamber by submucous resection of the septum. If this be inadequate to relieve stenosis of the nasofrontal duct, the anterior ethmoidal cells should be destroyed, together with the nasal portion of the maxilla, and the duct should be enlarged. Should the symptoms still continue, there should either be drainage secured by trephining or Killian's operation should be performed.

Lewis's preference is for the so-called Davis operation. The incision made in the brow extends from the supraorbital notch to a point corresponding to the articulation of the frontal with the nasal and superior maxillary bones. An opening 6 to 8 mm. wide is made in the anterior wall of the frontal sinus extending inward and downward to the articulation of the nasal process of the superior maxilla with the frontal and nasal bones. If more room be needed the opening is increased downward at the expense of the nasal process of the maxilla 5 to 8 mm., care being taken to follow its articulation with the nasal bone. This opening provides access to the anterior and posterior ethmoidal and sphenoidal sinuses. It now remains to destroy all septa and pyogenic and necrotic membranes with curette and forceps. The incision is closed by sutures, except at its lower angle whence emerges the gauze drain which passes below, intranasally. The gauze dressing is removed on the second day.

Mosher's intranasal operation for the exenteration of the ethmoidosphenoidal labyrinth is the method of choice. The agger nasi cell is the most anterior and lowest of the ethmoidal group, and, when large, is denoted as a mound just in front of the anterior end of the middle turbinate, but usually it lies beneath the anterior attachment of this body, where it bridges over the unciform groove. The distance from the lower edge of the ala, close to the cheek, to the inner canthus is a fairly good guide to the location of the agger nasi cell —the objective of the initial attack with the curette. After breaking into this cell, the instrument, with the cutting edge outward, is forced into the olfactory cleft and directed toward the lacrimal bone. The ethmoidal labyrinth has now been entered unless there is some departure from the usual anatomical arrangement of the structures. The curette is now brought into the median line, and with the bowl up (cutting edge downward) plunged backward about one-half inch and downward until the bulla is encountered and destroyed. The detruded anterior end of the middle turbinate is then grasped with suitable forceps and detached from its moorings. A few forward strokes of the curette will destroy the ascending process of the superior maxilla. This completes the exenteration of the anterior ethmoidal cells and, save in exceptional cases, permits of catheterization of the frontal sinus. When the nasofrontal opening is small, it is readily enlarged with a curette or rasp. During these steps of the operation the patient's head is flexed well backward and the finger placed along the inner canthus of the eye to detect the approach of the curette.

The patient's head is now brought into a forward position so that the roof of the ethmoidal labyrinth is level. Not to do this is to court disaster. The curette is now forced through the attachment of the middle turbinate into a large cell of the pos-

terior portion of the ethmoidal labyrinth and continued backward, by sweeping strokes, until the anterior sphenoidal wall is reached. The remaining posterior portion of the middle and the lower half of the superior turbinates are then removed with punch scissors, the upper blade following along the olfactory slit, the lower one in the exenterated labyrinth, to the posterior wall. If the foregoing steps have been properly executed, the sphenoidal ostium is usually distinguishable; if not, the curette is entered below, close to the septum, and worked upward until thin bone is encountered. The anterior wall of the sinus is then removed with the punch, after the size of the cavity has been ascertained by means of a bent probe.

Mosher urges caution while working in the posterior ethmoidal cells, especially at the upper and outer posterior angle, as in this perilous region the cranial cavity may be entered. The olfactory fissure is always a dangerous region, as virulent infections may easily be transmitted to the subdural spaces by the lymph vessels which accompany the olfactory nerve fibers.

Empyema of the sphenoidal sinus seldom occurs independently. Grayson has shown that the floor of the sinus in nearly every instance is situated at or just above the pterygopalatine groove. The guiding line is readily distinguishable after the application of adrenalin. At a point just above this line, and close to the rostrum, is the site of election for the entrance drill. When pus emerges from the opening made by the drill, the opening should be enlarged as much as possible by cutting away the anterior sphenoidal wall with a punch.

As for the maxillary empyema, exploratory openings through the middle meatus have several distinct advantages over the puncture of the inferior meatus. The wall is thin, membranous and readily pierced. In chronic cases a large opening must be made into the nose, to facilitate adequate curetting and permanent drainage.

The teachings of this article are of importance to both the surgeon and the practitioner, since they call attention to a focus of infection usually overlooked which may account for many crippling conditions, and particularly those associated with chronic arthritis. Incidentally it is shown that the symptoms of chronic empyema may be so slight as to escape attention. The fundamental surgical lesson from this paper is to the effect that if the acute condition be excepted it is only by adequate and wide drainage that these cases of persistent suppuration can be cured.

TREATMENT OF ACUTE EMPHYSEMATOUS GANGRENE.

It has been observed frequently by both the surgeons and the officers of the line that medical science deals no more effectively with the lacerated and infected wounds of to-day than it did ten, twenty, thirty, or forty years ago. Nor have the first-aid packets, nor antiseptics, particularly iodine, issued to the troops seemed, in the case of these wounds, to have been of any service.

Lawson and Whitehouse (*British Journal of Surgery*, January, 1915) observe that the outstanding feature of medical importance in the present European conflict is the incidence amongst the wounded of tetanus and acute emphysematous gangrene. Since adopting infiltration with hydrogen peroxide into the healthy tissues above the affected area they have not found it necessary to remove a single limb for infective gangrene. The procedure now adopted in all cases in which infection of a wound by anaerobic organisms is suspected is as follows: Half an hour before operation the patient receives a hypodermic injection of atropine sulphate, 1/100 grain, and morphine tartrate, ¼ grain. General anesthesia as a rule is employed; but if the patient is profoundly septic, and the wound involves the lower extremity, spinal anesthesia is preferred. A point is then selected three to four fingerbreadths above the line of advancing gangrene, as shown by the dusky, copper-colored tint of the integument. An incision about ¼ inch in length is made through the skin and subcutaneous tissues as far as the fascial sheath of the

muscles. A pair of sinus forceps is then introduced into the wound and the whole of the subcutaneous tissue opened up as widely as possible. The nozzle of an ordinary Higginson's syringe is introduced into the incision, and neutral hydrogen peroxide (10 vols.) at body temperature pumped into the subcutaneous spaces under pressure. The dissemination of oxygen is aided by kneading and massage. It is essential that the belt of oxygen be complete above the line of advancing gangrene, and therefore it is usually necessary to repeat the procedure at various points. This done, the gangrenous area itself is treated in a similar manner by puncture and infiltration. Finally, the wound is thoroughly explored and cleansed. All foreign material, dead and contused tissue, is removed, and the cavity irrigated with normal saline (just to wash away débris and clot), and then freely with hydrogen peroxide. Drainage by rubber tubes and gauze is established and the whole limb dressed with dry gauze and wool. Although much drainage may be anticipated, they consider it a mistake to employ huge quantities of wool and gauze in these cases. The aim should be to allow free access of air, coupled with efficient protection, to the wounded tissues.

The operation is followed by considerable shock, due undoubtedly to the wide separation of connective tissue and stimulation of nerve-endings. The usual measures are instituted to combat this, and morphine is freely administered to relieve the pain, which is generally very acute. At the close of the operation the limb is ballooned to twice its normal size, and the emphysema in the case of the upper limb frequently extends to the trunk and neck.

Of 11 cases treated by infiltration, eight were cured. Of three not treated by infiltration, all died. Of the three deaths occurring in cases treated by infiltration, one was due to osteomyelitis and septicemia; another to shock; whilst the third was a fatality under anesthesia in a subject of lymphatism, and not attributable to the condition present, or to the operation. In the case of osteomyelitis, an extensive compound comminuted fracture was present.

The conclusions appended to this paper are as follows:

Acute infective gangrene due to B. aerogenes capsulatus or B. œdematis maligni, in the case of the extremities, is at first a purely local process, spreading by direct continuity in the subcutaneous tissues. The muscles and deeper tissues are only involved in the immediate neighborhood of the wound.

When gangrene of the whole limb exists it is due to severe trauma, especially to the main vessels. Acute infective gangrene and traumatic gangrene may be superimposed.

Amputation of a limb for acute emphysematous gangrene is unnecessary, unless the whole of the tissues are involved over a very extensive area. It is sufficient to remove only dead and dying tissues, and amputation high above the infected area is contraindicated and may prove fatal from shock.

Infiltration of the healthy subcutaneous tissues with oxygen, above the line of spreading gangrene, is sufficient to check the advance of the infection, and in the majority of cases the limb may be saved.

The most convenient means of applying nascent oxygen to the tissues is by the injection of warm neutral hydrogen peroxide.

Since the operation is not unattended by risk, care must be taken to obviate shock and trauma to veins.

Since this paper was written four other cases of acute emphysematous gangrene have been admitted to No. 8 General Hospital. Three of these involved the upper extremity, and one the lower. All have been treated by the method of infiltration, and all have recovered without the sacrifice of a limb.

One of these cases was further complicated by severe tetanus, and was successfully treated by daily lumbar injections of antitetanic serum (1500 units) and the adoption of the Trendelenburg position.

The direct subcutaneous administration of oxygen or air apart from hydrogen peroxide is under consideration as a means of checking the spread of anaerobic infection.

Under circumstances where the more

thorough method of infiltrating hydrogen peroxide cannot be carried out as above described (such as, perhaps, in clearing hospitals and ambulance trains), it is possible that injecting it in smaller quantities with an antitoxin or other suitable syringe might arrest the spread of the disease until, at least, the patient arrived at a fixed hospital. The authors have successfully treated a case by this method.

The later reports from the front show that antitetanic injections given promptly to the wounded have been entirely successful in preventing tetanus, hence in so far as this complication is concerned it becomes simply a matter of adequate supply and immediate administration. Against the gas bacillus the bacteriologist and serologist have as yet given us no protection, hence the importance of a treatment which though traumatizing and shocking seems to have been efficient in a small number of cases.

REPORTS ON THERAPEUTIC PROGRESS.

GLYCOSURIA.

In the *Lancet* of November 14, 1914, TIRARD writing on this topic attempts to determine the relative influence of various drugs.

Directly the writer introduced a system of keeping records in graphic form, it was realized that the method was likely to be valuable in enabling him to trace the influence of drugs upon the amount of glycosuria. In these investigations it was obviously important to avoid being misled, either by the sensations or statements of the patient or by making changes of more than one factor at a time. For example, if possible he never changed the diet and the treatment simultaneously. Further, when a change of remedy was made he endeavored to give the new remedy in a similar form to the one previously used—he might substitute one pill for another of different composition, or one mixture for another, but he did his best not to confuse the issue either by making too many changes at once or by placing reliance upon statements of improved sensations, which conceivably might be due to the sanguine expectations of a new mode of treatment. He sought cold, impartial accuracy rather than the enthusiastic welcome of some new thing.

In the selection of the remedies employed the writer has been guided sometimes by theoretical considerations, sometimes by statements of the experience of other clinicians. Some of the remedies have been clearly used or recommended on an idea derived from physiological experiments, and therefore have some relation to the prevalent theory of glycosuria. Some have direct reference to the pancreatic theory, others appear to have connection with digestive or other ferments, while of some the explanation is so elusive that they come under the banned (but useful) heading of empirical remedies. The writer's desire has been to form an impartial opinion upon the value of the remedy in the individual case, and the conclusions must be taken merely as indicating that in that particular case certain remedies have or have not given satisfaction.

The writer does not propose to enumerate all the remedies that have been tried in his wards within the last few years, but to select for special mention only those where his charts indicate divergence from the observations of others, or where he has had reason to believe that benefit was directly due to the drugs. He has not found any remedy that can be considered universally applicable.

Codeine has been used in many cases, but in the writer's hands the benefits, so far as sugar is concerned, have not been very obvious or constant. He does not deny that the records may sometimes have shown a certain reduction of the daily output of sugar during the time that codeine, or derivative of opium, has been employed, and, while freely admitting that

some patients appeared less troubled by thirst while taking codeine, and some were certainly less nervous and worried, he has occasionally feared that these drugs might be harmful. When the dose was increased from a third of a grain to half a grain he sometimes observed disquieting apathy and drowsiness, which led to a discontinuance of the drug. These symptoms may have been the direct result of the hypnotic influence of the codeine, or they may have been due to an arrest of the elimination of glucose, but in either case they were disquieting, as they resembled the usual forerunners of diabetic coma.

The writer's charts show that the use of sodium salicylate or of acetylsalicylic acid has given far more general satisfaction both in comparatively mild and in severe cases. When employing sodium salicylate in a case in which the glucose had been gradually reduced by dietary restrictions, the writer found that during the administration of the drug the glucose ultimately disappeared, and the benefit persisted even when a moderate amount of carbohydrate was allowed. For a short time any attempt to reduce the amount of salicylate while bread was being given was followed by a reappearance of glucose in the urine, but eventually it was found possible to allow two ounces of bread daily, even when the salicylate had been finally discontinued.

In collating his material the writer has found that he has made free use of large doses of sodium bicarbonate. This has in some cases been employed comparatively early, and it has been used to attempt to reduce the high degree of acidity which is so often present, even without any suspicion of acidosis. In his experience of hospital patients it has been extremely difficult to reduce this persistent acidity. Rarely, after very large doses, the urine has been rendered alkaline for a short time, but it has always speedily returned to a neutral or acid condition, in spite of the use of the bicarbonate.

The writer ventures to lay some stress upon this observation, since most observers advise that, with the onset of toxic symptoms, indicated by drowsiness, severe headache, or coma, or by changes in chemical reaction showing the presence of acetone or diacetic acid, the urine should be rendered alkaline as quickly as possible. This is quite good advice, but it is not easy to obtain an alkaline reaction quickly, and it is still more difficult to maintain an alkaline or neutral condition of the urine for any length of time.

Guided by earlier experience the writer finds that more recently he has frequently commenced medicinal treatment with a mixture of sodium salicylate and sodium bicarbonate, the quantity of bicarbonate being from twice to three times the amount of salicylate. The amount has been largely determined by the degree of acidity of the urine, or by the presence of drowsiness or other toxic symptoms.

When it has appeared that a stationary stage has been reached beyond which no further benefit seemed to result from modifications of dosage, while still continuing these remedies, the writer has given occasionally other drugs in turn, and has carefully noted the results. In one such case, which was under observation for many months, he was able to watch in turn the influence of codeine, taka-diastase, and of trypsogen.

The writer has already referred to his general experience with codeine in connection with other patients. In this particular case his chart showed that it exerted no material influence upon the output of glucose, while on the other hand the patient so often became dull and lethargic that it was deemed advisable to stop the administration.

In this case, and in others, the writer was similarly unable to confirm the favorable observations of others with regard to taka-diastase. The reports made by Dr. E. J. G. Beardsley, of the Jefferson Medical College Hospital, were so striking that they merited investigation. He stated that taka-diastase had a tendency to alleviate all the symptoms in diabetes. He said it decreased the amount of sugar for a time, but this finding was not constant. He asserted that,

even while the sugar increased during the administration of the drug, the symptoms were relieved. He admitted, however, that the patients seemed more depressed for a few days following the first administration of the drug. From the writer's observations he is inclined to agree with Dr. Beardsley so far as concerns the depression, but in the writer's hands taka-diastase has been connected with an increase of glucose, with no amelioration of other symptoms. The writer must admit that he has employed taka-diastase in a relatively small number of cases, and, therefore, can only say that in these particular patients the increase of glycosuria and the absence of any tangible improvement did not warrant a continuance of the treatment, and did not appear to justify further trial upon other patients.

With regard to trypsogen, the writer's experience has been limited to its use on two patients. On the first occasion that it was employed the amount of sugar went up when three tablets were given three times a day. The use of trypsogen was continued for nineteen days, when it was thought wise to leave it off as the amount of sugar still remained high. When it was discontinued the sugar went down to the merest trace, and later, the amount of sugar having again risen, trypsogen was given three times a day, with the result that the sugar rose with a huge bound, and after eight days it was again discontinued. The writer may add that on each occasion the patient objected strongly to the use of the drug.

It having been stated that calcium iodide very rapidly reduced the output of sugar in many cases, where neither dieting nor the use of codeine had had much effect, the writer determined to test the value of this remedy in suitable cases. It was given twice daily in 5-grain doses to one patient for nine days. Before the administration he was passing 1520 grains of glucose in twenty-four hours, on the fourth day he passed 2000 grains, and the amount increased to 2440 grains on the ninth day, when it was thought advisable to discontinue. In the second case the same dose was given three times a day. At the commencement 1600 grains were being passed. After a week of treatment it was found that the sugar had increased to 2120 grains. In a third case 10 grains of calcium iodide were given three times a day. This was continued for thirty-two days, during which time curious oscillations of the sugar curve were observed. Starting from 1920 grains it fell in four days to 1480 grains. Then it rose with an oscillating line until it had reached a level of 2560 grains in another eight days. Then in five days it fell rapidly to 840 grains, after which, with fairly wide oscillations, it steadied at an average of 1600 grains. This experience of calcium iodide is confined to three cases, but since it entailed daily estimations over a period of seven weeks it is perhaps sufficient to cast some doubt upon the value of calcium iodide, and may serve to save others from similar disappointments.

PRURITUS ANI.

NORBURY in the *Practitioner* for November, 1914, gives this advice as to treatment: It must be both local and general. In the first place, if a definite cause can be discovered, such as threadworms, these must receive appropriate treatment. It is obviously only a temporary expedient to treat the local manifestations, unless the prime cause of the condition be also dealt with. The urine should be examined for sugar. If a fissure, fistula, or hemorrhoids be present, they must receive proper attention; hypertrophied papillæ should be cauterized; granular proctitis should receive local applications by means of the sigmoidoscope or by rectal injections. In every case a careful investigation should be conducted, in order to try and find the causative factor and to remove it if possible.

At the same time various local applications to the anal skin and its surroundings may be employed with marked benefit. If no definite lesion can be discovered to account for the symptoms, the treatment will of necessity be palliative. Various ointments

may be employed: mercurial ointments, ichthyol, carbolic ointment, or a preparation of lead acetate and oxide of zinc.

Swinford Edwards recommends the application of lead and milk in certain cases, the formula employed being:

℞ Liq. plumbi subacetat. fort., drachm j;
Lactis, drachm vij.

This should be freshly prepared daily, and applied by means of cotton-wool.

The tar product, liquor carbonis detergens, is sometimes very useful.

Bathing the part with 1-in-20 carbolic lotion will often give temporary relief. Ointments of cocaine or cocaine and bismuth will enable the patient to secure a few hours' sleep, when applied at bedtime. A method the writer has adopted on many occasions, and one which will often produce cessation or amelioration of symptoms, at any rate for several weeks if not longer, is to shave off the hairs of the anal skin and its immediate neighborhood, and then carefully to paint the anal folds and the spaces between these, not forgetting the post-anal groove, with pure phenol. This renders the part tender for a few days, but a good result is often obtained; zinc ointment is employed, until all soreness and tenderness have disappeared.

The writer has had one or two cases treated in this way in which relief from symptoms has been a lasting one. Thigenol —a synthetic sulphur compound, which may be used as a pigment or an ointment—may be applied in a similar way with good effect. It may be necessary to try many different varieties of applications before any marked effect is obtained. In very intractable cases, some form of operative treatment is usually required.

The following operations have been employed, often with marked success:

1. Scraping of the affected anal skin, after thorough stretching of the sphincter and excision of any anal tags of skin or hypertrophied anal rugæ. The actual cautery may take the place of scraping, the application starting just inside the anus and extending radially.

2. Ball's operation has for its object the division of all the terminal branches of the sensory nerves supplying the affected area. The patient is placed in the lithotomy position, and a semicircular flap of skin and subcutaneous tissue is dissected up from without inward toward the anus from each side, leaving a bridge of skin about one inch wide both in front and behind. These bridges are undercut to divide any nerve filaments. The outer concave edges of the incisions are also undercut. The flaps are raised as far as the anus, exposing the external sphincter, and the dissection carried up to beyond the mucocutaneous junction. Bleeding is stopped, and the flaps replaced and sutured. The results of this operation are very satisfactory; the pruritus is relieved or cured, and cutaneous sensation is gradually restored.

3. Krause's operation consists in making from four to six linear incisions, radiating from the anus, through the skin and subcutaneous tissue. The skin is undercut between adjacent incisions, until the whole affected area is undermined. Bleeding is stopped, and the skin sutured.

4. A modification of this operation has been devised by H. Graeme Anderson. Subcutaneous neurotomy is performed in the following way: A small incision is made on either side of the anus. A pair of scissors is then introduced, and the subcutaneous tissue, in which the sensory nerves are situated, is divided freely toward and away from the anus and around the whole circumference of the anal orifice. The incisions are sutured, and firm pressure applied to arrest hemorrhage. The results obtained by this method of treatment have been very encouraging.

There is said to be less risk of sloughing of the skin with these last two operations than with Ball's operation.

Another method of treatment, which has been tried recently for cases of chronic pruritus, is that of zinc cataphoresis. A 2-per-cent solution of zinc sulphate is placed in the rectum, one electrode is placed over the bowel and the other on the back or some other portion of the body. A current of

40 milliamperes is employed for about ten minutes at a time. This process may have to be repeated on several occasions at intervals of a few days. Temporary relief has been obtained by this method, but the ultimate results have not been very satisfactory.

TRANSFUSION IN THE TREATMENT OF HEMORRHAGICA NEONATORUM.

The *Boston Medical and Surgical Journal* of November 5, 1914, contains an article by GREEN on this subject. He concludes that:

1. Transfusion is a procedure of definitely established specific curative value in the treatment of hemorrhagic disease of the new-born.

2. By its use the mortality of this disease has been already reduced from 50 to 10 per cent.

3. A probable further reduction of mortality may be expected in future from its more prompt and universal application.

4. Successive improvements and simplifications in the technique of transfusion have now made its performance possible by surgeons of average training, experience, and skill.

5. Even with transfusion, the prognosis in the rare cases of hematuric hemorrhage is apparently much worse than in any other form of bleeding.

6. The greatest present need of further investigation in hemorrhagica neonatorum is into the knowledge of its probably syphilitic etiology.

DIGITALIS MEDICATION.

THOMSON in the *Clinical Journal* of October 28, 1914, reaches these conclusions as to the action and the use of digitalis:

1. Clinical and experimental evidence both show that, with the possible exception of certain rare forms of paroxysmal tachycardia, the specific beneficial action of digitalis is only exercised in the fibrillating heart.

2. Its use, therefore, should be determined entirely in reference to the presence of this condition, and not based on the presence or otherwise of any particular form of valvular lesion or muscular defect.

3. Its use is not indicated in cases presenting the normal rhythm.

4. In cases of heart block, or of arrhythmia due to extra systoles, it is not only useless but may do harm by accentuating the orginal condition.

5. Apart from the occurrence of fibrillation, it is quite valueless in heart failure due to pneumonia or other acute fevers.

6. When used at all it should be pushed to the limit of tolerance, and then maintained in doses just sufficient to exert its beneficial effects.

7. When fibrillation is permanently established digitalis must be continued for an indefinite period.

8. There is no evidence that it produces any rise of blood-pressure, wherefore it is not contraindicated in the presence of hypertension.

ARTIFICIAL PNEUMOTHORAX.

BALBONI in the *Boston Medical and Surgical Journal* of November 5, 1914, describes the technique he employs in producing artificial pneumothorax in the following words:

The finger of one hand is placed firmly in the interspace chosen for the puncture, and with the other hand the local anesthetic is injected with a common glass hypodermic syringe having a long, firm, thin, sharp needle. As a local anesthetic the writer uses the following solution of novocaine and adrenalin, as advised by Robinson:

Novocaine, 0.5;
Adrenalin, 1.0;
Aqua destillata, 100.0.

Thirty minims of this solution is usually sufficient, but more may be used without giving rise to untoward symptoms. It is inserted slowly through the skin and then straight through the tissues until from a lack of further resistance it appears the parietal pleura has been perforated. Then

a little more of the solution is injected to anesthetize a small area of the pleura. No harm will be done if some of the anesthetic gets into the lung. By injecting the anesthetic slowly, as one feels his way through the different layers of tissues, a channel is thoroughly anesthetized for the subsequent introduction of the pneumothorax needle. (It is essential to the success of the operation that it be painless.) The writer is accustomed at the first puncture to inject with the local anesthetic from one-eighth to one-fourth grain of morphine to diminish the discomfort and cough due to the pressure excited by the nitrogen.

After a few minutes, when local anesthesia is complete, the pneumothorax needle is introduced in a direction perpendicular to the chest wall. The smallest caliber pneumothorax needle is to be used. It is firmly held in the right hand between the thumb and index and middle finger, just as a pen is held in writing. The index-finger of the left hand is placed firmly in the interspace beside the anesthetized spot while the needle is inserted gently, slowly and firmly through the anesthetized channel to a depth varying according to the thickness of the tissues. The insertion should be made exactly in the center of the interspace to avoid the intercostal artery. From careful measurements in the writer's series of cases, he has found that usually when the needle has been inserted two centimeters it is about to perforate the parietal pleura. In very thin or fat subjects this depth varies. These measurements, of course, apply only when the precaution is taken to press firmly on the tissues in the interspace when the puncture is made. This firm pressure in the interspace is of great importance, especially in the alternate insertion and withdrawal of the needle in attempts to reach the pleural cavity. By introducing the needle slowly, an opportunity is given for the visceral pleura to react. If one has had considerable experience with punctures, and has a fairly exact tactile sense, he soon learns when the point of the needle has reached the pleural cavity.

After the writer has inserted the needle to a depth which he thinks is almost that of the parietal pleura, namely, at the endothoracic fascia, he transfers the needle to his left hand in order to have the right hand free. Then he withdraws the stylet from the needle, closes the needle-cock, and holding the needle firmly in place and carefully observing the manometer which is in direct connection with the needle, he inserts the needle a little deeper unless it is already in the pleural cavity as shown by the manometer. When the point of the needle enters the pleural cavity one may immediately feel a lack of resistance such as is felt when perforating a sheet of paper with a needle. Frequently as the endothoracic fascia and parietal pleura are perforated, a distinct snapping sound may be heard. If the deep tissues have not been completely anesthetized, the patient may feel a distinct, sharp pain.

When the point of the needle has pierced the parietal pleura, as a rule the manometer indicates that the pleural cavity has been reached by the characteristic pleural respiratory oscillations, which are always negative in pressure. The manometer then shows characteristically distinct oscillations. The differences of level are from 4 to 10 or more centimeters, and their lowest point, about which they oscillate, is higher on the side of the manometer which is in connection with the needle than on the other side. If these characteristic oscillations are not obtained, the needle is moved slightly inward or outward, or the stylet is passed into the lumen to remove any obstruction. If the characteristic respiratory oscillations are now not obtained, then another spot must be selected. Never move the needle sideways, for if it should be in the lung, the latter may be easily torn by it. By keeping the needle straight, one runs less risk of puncturing the lung or of tearing a pleural adhesion. Usually, of course, a superficial puncture of the lung is immediately sealed up and causes little inconvenience. Still a puncture or a tear of the lung must never be considered an indifferent procedure, for even if that portion of the lung is not a seat of disease, it may

cause serious complications. If the point of the needle comes into contact with adhesions, the respiratory oscillations cease or become small or jerky in character.

TREATMENT OF MIGRAINE.

The *Journal of the Missouri State Medical Association* for October, 1914, contains an article on this topic by CAMPBELL. He says that if a person subject to migraine will take a medicinal dose of glonoin, say one drop of spts. glonoin, on his tongue, its effect will depend very much on whether he has had one of his headaches within the last few days or not. If he has just had a headache he will get the glonoin effect—the throbbing vessels and slight head pain—which will shortly subside and leave no trace behind it. If, however, it is somewhere near the time for his next headache he will get the glonoin effect, and as this subsides it will bring in its wake his regular migraine attack. The glonoin will have as it were touched off his migraine headache. The practical fact behind this is that when glonoin is thus administered three times daily after meals and kept at a dose distinctly perceptible to the patient, through a period of months, the effect on his migraine is very satisfactory both to him and to his medical advisor. [The remedy would appear to be as bad as the disease.—ED.]

In thus administering glonoin, however, it must be borne in mind that a tolerance is very readily established, and that in order that a glonoin effect perceptible to the patient—namely, the sensation of throbbing or flushing or slight headache—may continue to be produced, it is almost always necessary that the dose be increased from time to time, and usually to many times the amount with which one commences. The writer is daily giving such patients 20 or 30 drops of spts. glonoin after each meal with no more disturbing effect than they have frequently felt from the minim at the commencement. The good effect of glonoin is just as manifest in migraine cases with a habitually low blood-pressure as in those cases in which the blood-pressure is high, nor does the larger dose have any effect on the general health perceptibly different from the dosage usually employed.

The only trouble encountered is with the druggist from whom the medicine is obtained. He frequently has to be reassured before filling the prescription calling for the dose in question. In certain patients, however, at the commencement of the treatment the above-mentioned tendency of glonoin to touch off the headaches must be kept in mind, for a very small dose will for some weeks be capable of keeping them in what might be called a migraine status. In such patients the dose must be small, often no greater than one-fifth of one minim, until tolerance is established.

In a considerable number of cases of migraine it is difficult to get free and satisfactory bowel action by dietary means, and where such is the case it is well to have an examination made for a tight sphincter or spastic sigmoid, the correction of which defects will be of great help to the patient.

While the routine use of a laxative is usually an evil, it seems occasionally to be a necessary evil; and in the cases in which free diluents and a freely cellulose diet with added cellulose in the form of agar-agar fails to answer the purpose, the writer gives a saline each morning, according to the formula advised by Dr. Ratchford of Cincinnati, consisting of a stock solution of magnesium sulphate 50 grains, sodii sulphate 30 grains, sodii salicylate 19 grains, and tr. nucis vomica 3 minims, in 4 fluid-ounces of water, to which is added half a tumbler of carbonated water from a siphon bottle.

To summarize, when you think of migraine, think of Dr. Cabot's remark about headaches occurring in lazy, constipated, gluttonous people. If the patient does not deserve three accusations, he often is open to at least one. Remember that a patient may have a daily bowel action and yet be constipated.

In all cases of migraine, treatment should consist of, first, a sufficiency of outdoor recreative exercise, first strengthening the muscles, if required, and stimulating the

patient's interest and pride in physical accomplishments, and, where possible, mixing pleasure with the exercise; second, a diet abundantly rich in cellulose with agar-agar added if necessary, and from which sugar is eliminated, proteid given very sparingly, and starch in moderation only; third, where the above diet and abundant diluents fail to keep the bowels free, the rectum should be attended to, or, this failing of effect, a saline as above advised should be regularly employed; and finally, the patient should receive three times daily, after meals, a dose of spts. of glonoin sufficient for him to feel the physiological effect in slight headache or throbbing of head or flushing of face shortly after taking each dose, and the dose should be maintained at or very slightly beneath this level. It must be remembered that to maintain this effect the dose has often to be greatly increased, sometimes to gtt. 30 or more three times a day. Such a régime has, in the writer's hands, brought much relief to patients with a condition in which the suffering from headache, severe though it often be, is of minor importance compared to the effect on the cardiovascular system and life expectancy itself.

RIGG'S DISEASE AND ENTAMŒBA BUCCALIS.

Bass and Johns in the *New Orleans Medical and Surgical Journal* for November, 1914, believe the entamœba buccalis to be the cause of pyorrhea alveolaris and treat it accordingly.

The results of the writers' experiments, so far, are most gratifying. They have had sixty-eight cases under observation with treatment from two days to two weeks. The doses of emetine experimented with have been from one-half to one grain. Only one dose was given in a day. Several cases have been given a dose daily for several days. Others were given one or more doses until the amebæ disappeared, after which an interval was allowed to determine how long it would be before they would return, or what other results could be observed. In several instances no amebæ could be found the next day after the first dose was given. In a few, however, they were found the next day after emetine had been given on two successive days. In no case have the writers been able to find amebæ the next day after emetine had been given on three successive days.

As to the duration of the absence of demonstrable amebæ following the three (or less) doses of emetine, the writers' studies have not been conducted long enough to determine. In one instance they found amebæ on the fourth day after the last emetine had been given. In another instance they found them on the sixth day. In several instances none could be found after seven days or longer intermission of treatment. On account of the wide distribution of the amebæ in nature and the character of the lesions of the disease, the writers do not think it very likely that bad cases of pyorrhea alveolaris will be permanently disinfected by a few doses of emetine given during a few days. The chances of reinfection are so great and the damaged gum, alveolar and tooth structure offer such favorable soil that it must surely be necessary to continue the specific treatment until nature has had time to fully heal the disease. The length of time necessary for this will no doubt depend upon many factors. Healing and repair of diseased bone is always slow. When the disease involves only the gum, and has not reached the bone (alveolar structure), it is the writers' impression, from observations so far made, that probably the length of time for the gum to heal will not exceed a week. They have observed great change in forty-eight hours, and gums that bleed easily often become perfectly normal in this regard in from twenty-four to seventy-two hours. The results are so striking that there is no doubt in the mind of the doctor or the patient.

The writers' experiments have not advanced sufficiently to enable them to lay down dogmatic rules as to the treatment, but they are certain that rapid and favorable results may be expected to follow the administration of one-half grain of emetine

hydrochloride hypodermically (in any part of the body) daily for three or four days. In all except the early, mild cases it may be necessary to repeat the treatment, during one or more days, after an interval of three to ten days. In the worst cases it will probably be found necessary to repeat the treatment several times before the disease is entirely well. No doubt removal of tartar, scales, and other local dental treatment should also be done at the same time. It is quite likely that the injection of a weak solution of emetine, one-half per cent, as used by Barrett, into such lesions as can be reached by it will be found to favor success from the hypodermic treatment with emetine.

THE TREATMENT OF ADVANCED PULMONARY TUBERCULOSIS.

KNOPF, in the *Medical Record* of October 31, 1914, says that in treating the distressing dyspnea and thoracic pains met with so often in the advanced cases of pulmonary tuberculosis, he has found the old-fashioned dry-cupping a most valuable remedy. Sometimes the vague and undetermined pain can be relieved by a wet pack consisting of a cold compress over the apices and a wider one around the thorax, the whole covered with flannel. The writer likes this better than the typical Priesnitz compress with its intervening layer of oiled silk. He does not favor the actual cautery recommended by French phthisio-therapeutists, nor blistering, nor the too frequent applications of iodine. He would rather give the mustard plaster the preference. Of course, in some instances the dyspnea and pain are so intense, particularly in the last stages, that strychnine, nitroglycerin, or morphine alone will give relief.

High temperature in the advanced tuberculous cases is another symptom most exceedingly difficult to combat. Fresh air, repeated partial sponging with lukewarm water every two hours, particularly in the afternoon, the ingestion of plenty of cold water, ice-bags or coils with circulating cold water over the head and over the heart, pyramidon in 3- to 5-grain doses three to four times a day, according to indications, are, in the writer's experience, the most efficacious remedies ordinarily at command.

Against the troublesome night sweats, likewise a result of mixed infection, the fresh, pure and cold air, whenever it can be gotten and if the patient can stand it, is the best non-medicinal remedy. The fact that sometimes the advanced case of tuberculosis, when accustomed to outdoor life and the cold weather, feels best in the coldest weather has made the writer think that if we could arrange in our sanatoria some sort of artificially cooled air chamber where the temperature could be graduated, and here place the highly febrile cases, we might perhaps be able to count a few more recoveries or at least improvements. When medicine is needed, the atropine tablets of 1/100 or 1/60 of a grain, 5-grain powders of agaricin, or the same quantity of pyramidon may have to be resorted to to combat hyperhydrosis. A little dietetic adjuvant which the writer has often found helpful with his phthisical patients when suffering from night sweats, is a midnight luncheon consisting of a glass of milk and one appetizingly arranged sandwich for the patient to take when he awakes weakened because of perspiring.

Artificial pneumothorax, with a view to compressing the most affected lung to diminish the absorption of toxins and thus diminish fever and night sweats, must be considered as one of the most valuable modern therapeutic means in treating advanced tuberculosis. Unfortunately one does not always succeed in performing a successful therapeutic pneumothorax because the advanced pulmonary case presents numerous pleuritic adhesions which make the entrance into the intrapleural space exceedingly difficult and sometimes impossible.

Insomnia, when not merely due to the distressing cough, can often be overcome by taking one of the well-known hypnotics, such as trional or veronal, with hot milk a few hours before retiring. One should, however, remember the depressing influence of these drugs and only give small doses, and not constantly.

The gastrointestinal disturbances which manifest themselves almost invariably in the advanced cases will task the ingenuity of the attending physician. One will not only have to examine carefully the character and composition of the stool to discover possible dietetic errors and correct them, but must also study very intimately the idiosyncrasies of the patient appertaining to certain foodstuffs and his likes and dislikes. Sometimes the patient's intestinal tract has been impaired by overfeeding.

Anorexia, flatulence, and constipation alternating with diarrhea may be the result of more functional disorders due to tuberculous invasion of the intestinal tract. One thing always to be thought of in combating anorexia is the oral hygiene. The teeth must be kept in as good condition as possible. They should be brushed after each meal and the mouth kept clean by refreshing cleansing washes. A light mixed diet is the first thing to be insisted upon. Tonics may be indicated, and one of the writer's favorite prescriptions for this condition is the following:

Tinct. nucis vomicæ, f℥ij;
Tinct. cinchonæ,
Tinct. colombæ, ää f℥j;
Tinct. gentianæ, q. s. ad f℥iv.

M. S.: One teaspoonful in three tablespoonfuls of water before meals.

Constipation in the tuberculous must be treated in the same way as in other persons —first dietetically by ingestion of more liquid and the use of whole-wheat bread and stale or hard-crusted bread, instead of the typical American doughy white bread, more fruit, and vegetables cooked by the steam process. If this does not suffice, medication becomes necessary, but it must always be varied. One should never give the same remedy a long time in succession, but rather alternate with calomel, the saline preparations, castor oil, cascara sagrada, etc.

Ten to fifteen drops of diluted hydrochloric acid given in one-third of a glass of hot water with meals will often help functional disturbances of digestion. Flatulence and diarrhea will be benefited by leaving off the carbohydrates in the diet; a mere milk and vegetable diet will prove valuable in combating this trouble.

The typical intestinal tuberculosis must be treated with careful liquid or semiliquid diet; fruit and green vegetables should be avoided. The following two prescriptions are the ones which have rendered the writer the best service:

℞ Pulv. opii, gr. iij;
Bismuthi subnitratis, ʒjss.
Sodii bicarbonatis, gr. xlv.

M. F. in chart No. 9. Sig.: One powder three to four times a day.

℞ Pulv. opii, gr. vj;
Acidi tannici, ʒj.

M. ft. in chart No. 12. Sig.: One powder every four to six hours as needed.

King, in his article on Tuberculosis in Forchheimer's "Therapeusis of Internal Diseases," says that colonic irrigations with silver nitrate (1/5000 solution) seem to have a pallative effect in certain cases and may be tried.

Pulmonary hemorrhage in the advanced cases may vary in degree and duration just as it does sometimes in earlier cases. Quiet in bed and the controlling of the cough is, of course, indicated, no matter whether the hemorrhage is slight or severe. Morphine will perhaps always remain the most important remedy in pulmonary hemorrhage, and locally the application of ice to the chest wall, particularly over the heart, should also be considered indispensable. Emetine hydrochloride (¼ to ½ gr.) or coagulose may also render good service.

In a severe pulmonary hemorrhage, the immediate thing to do is, of course, to ligate the upper and lower extremities with the aid of a silk handkerchief, flannel band, or some instruments specially devised for that purpose, to diminish the flow of blood to the thorax. These ligations of arms and legs are made as near the trunk as possible, and just tight enough to hinder the return of the venous flow, but not to compress the arterial pulse. Every half-hour or so the bands should be loosened, provided a too painful compression of some nerves or a threatening anemia of the brain does not

demand an earlier removal of the ligatures. Under ordinary circumstances these constricting bands can be renewed after short intervals as often as the condition of the patient may indicate. A hot-water bag should at the same time be placed at the feet. To lower the arterial pressure pituitary extract might be advantageously resorted to. If the reverse effect is desired—that is to say, if the hemorrhage has about ceased and there has been considerable shock and a cardiac stimulant is indicated—adrenalin might be given in small doses, for example 5 drops of a 1:1000 solution.

In constantly recurring hemoptysis when there seems to be no tendency to clot formation, the use of fresh horse or rabbit serum seems to be of value. The writer has only had experience with the fresh horse serum, and found that 15 to 25 Cc. injected for two or three days consecutively was most efficacious. Dr. M. Nicoll, Jr., who is in charge of the laboratory for making and distributing sera for the Health Department, and through whose courtesy the writer came into possession of the serum, writes him concerning the indication for the use of the horse serum in hemoptysis as follows: "The cases that seem to respond favorably to the action of the horse serum are those that have a steady oozing from their lungs with occasional small hemoptysis. The ordinary procedures—*i.e.*, rest, sedatives, ice—of course should not be omitted. The average dose for an adult should be 10 to 20 Cc., given hypodermically every twelve to twenty-four hours until results have been produced—say up to six or eight doses if necessary; 50 to 100 Cc. have been used, I think, unnecessarily, and with no better result than from smaller doses. A serum rash perhaps with some rise of temperature may be expected in many cases. No bad results have, to my knowledge, followed the use of serum for this purpose. In asthmatic cases a few drops should be used at first and ten minutes allowed to elapse before giving the full dose in order to ward off the danger of anaphylaxis."

Of course, when it is possible to perform an artificial pneumothorax there seems to be no remedy which acts more promptly to check a seemingly uncontrollable hemorrhage than this operation. The writer had remarkable success in a number of such cases with this procedure.

SCOPOLAMINE-MORPHINE IN LABOR.

The *Lancet-Clinic* of October 24, 1914, contains an article by TATE on this subject. Summing up the whole question as it now stands, the writer believes:

1. That the profession at large will never adopt this treatment, because it is complicated, requires too much time, and is dangerous if not used properly.

2. That it will receive from American obstetricians, who have the opportunities and facilities, a fair and impartial trial.

3. That with proper cases, ideal surroundings, and the case in the hands of a competent obstetrician, many women may be carried through their confinement with little pain, whether they use this treatment or resort to our usual remedies as now employed.

4. That condemnation should not be too strong on the part of the inexperienced and incredulous at the present time.

5. That with the writer's limited number of cases, not treated strictly according to the method laid down by the Freiburg clinic, he is not wholly discouraged, but intends to further study this treatment, and when proper cases present themselves, to try it according to his understanding of its administration, and later on he will be in a position to either condemn or approve with at least satisfaction to himself.

RESULTS OF ARTIFICIAL PNEUMOTHORAX.

LISTER, in the *Clinical Journal* of October 21, 1914, states that Professor Saugmann has published a most complete account of the results of pneumothorax treatment. As his experience is quite exceptional and most carefully reported, Lister quotes his figures. In treating 141 patients,

at least nineteen months before speaking, he had been successful in producing pneumothorax in 95 instances. In 43 cases he considered that he had failed or that the pneumothorax was too small to be effective. He considered that 100 of his cases were suitably selected cases; the remainder were not cases that one would have selected for treatment, but cases in which life was threatened by serious progressive disease or complications of a tuberculous or other nature. These he classifies as having been quite hopeless cases in which the treatment was adopted to give them a chance. Of those cases which would be considered as suitable for pneumothorax treatment, 100 in all, 64 were successful as regards the induction of the artificial pneumothorax, and in 36 the pneumothorax failed. The after-history of the cases in which the pneumothorax was successful as compared with those in which the pneumothorax failed affords a very remarkable piece of evidence. All these patients were under the same sanatorium conditions, and they were patients of practically the same class, where the lung on one side was much less affected than the lung on the other side. Lister quotes his table:

(1) Fit for pneumothorax treatment—

	Pneumothorax effective (64)	Pneumothorax failed (36)
Able to do ordinary or lighter work	32	8
Unable to work on account of tuberculosis	18	12
Dead from tuberculosis	12	14
Unknown	0	1
Dead from acute complications	2	1

(2) Not considering the last three, the percentages are as follows:

Able to work	50.0	22.2
Unable to work	28.1	33.3
Dead from tuberculosis	18.7	38.8
Freed from tubercle bacilli	50.0	8.6

The most striking feature is perhaps the last, which shows that where the pneumothorax was successful 50 per cent of these cases lost their tubercle bacilli, while where it was unsuccessful only 8.6. The writer reminds us that all these patients were of the same class clinically, under the same treatment, and only differed as regards the success or failure of the attempt to induce an artificial pneumothorax.

Professor Saugmann has maintained the compression of the lung for varying periods up to five years, but with the greater number two years was the longest period. He has observed some of his cases for as long as two, three, four, and six years after stopping compression, and he quotes seven such cases who are free from symptoms. His careful analysis is well worth reading by those who wish to follow up the treatment, but Lister has brought before us sufficient of his figures to show that this mechanical treatment of pulmonary phthisis has to be carefully considered. One must admit that there are cases in which, other things being equal, the chance of complete arrest of the disease and the disappearance of the tubercle bacilli is greatly increased by the induction of artificial pneumothorax.

BACILLARY DYSENTERY AND ITS TREATMENT.

MUSGRAVE and SISSON, in the *Philippine Journal of Science* for June, 1914, state that the routine treatment in the Philippine General Hospital which has given the most satisfactory results consists in the following:

First, absolute rest to save the strength of the patient and to prevent the involvement of the larger segment of the intestine.

Secondly, the early administration of some mild laxative, preferably sodium sulphate or magnesium sulphate, preceded by fractional doses of calomel in order to diminish the presence of infecting material in the gastrointestinal tract, as well as to get rid of some irritating material that might be present there. The administration of simaruba officinalis combined with some opiate is highly recommended, for it has given the writers the most satisfactory results in comparison with the use of other drugs. As an adjuvant to this treatment, the judicious use of normal salt solution as an enema, or given in the form of the drop method per rectum in the amount of one liter once a day, is sometimes very beneficial.

When the acute stage of the disease has subsided, enemata of hydrogen peroxide in weak solution (about 25 cubic centimeters in 500 cubic centimeters of water) once a day are a great help toward prompt recovery.

The use of ipecac, although strongly recommended by some writers, has not given the authors universal satisfaction. While some patients are benefited by this drug, there are a great many cases in which the use of ipecac becomes another sort of torment to the sufferer. There are many persons who abhor this drug to such an extent that even the smallest amount of it, though combined with opium, is apt to produce in them marked emesis. The writers have seen cases that were not even able to tolerate Dover's powder given in almost homeopathic doses. This is the greatest drawback to ipecac, and the deëmetinized preparation is almost useless, as the active principle of the drug, the emetine, is the only one that has some therapeutic action in the treatment of dysentery. The use of astringents and the so-called gastrointestinal antiseptics the writers have given up as unsatisfactory. Although there is a small percentage of patients who recover under this treatment, one should remember that there are cases that get well even without any medical treatment, and the writers consider it problematical whether or not the usual astringents and gastrointestinal antiseptics are really beneficial in the treatment of this disease. The fact must be kept in mind that most of the astringents and so-called intestinal antiseptics, such as bismuth, tannic acid preparations, salol, beta-naphthol, benzo-naphthol, benzoic acid, and others, have an irritating action upon the stomach and intestines, especially if they are given in large amounts and over a considerable period of time.

The use of the ice-bag over the abdomen is a great help in diminishing the abdominal pain, and hot turpentine stupes frequently are useful for the same purpose.

The essential part of the treatment, however, is dietetic. During the first twenty-four hours of the acute stage of the disease food must be withdrawn. Pieces of cracked ice may be given to allay thirst. At the end of twenty-four hours the patient is allowed albumen water or rice or barley water, and later skimmed or peptonized milk. When improvement has begun, milk, broth, beef juice, and orange juice may be given. The mouth must be frequently cleansed with an antiseptic mouth-wash to prevent the frequent complications of parotitis and gastritis.

The serum treatment, first recommended by Shiga in 1898, has both advantages and disadvantages. If the variety identification of the bacillus which is the cause of the infection can be carried out with readiness, as well as with accuracy, this scientific treatment ought to yield a greater percentage of cures than usually is obtained. For practical purposes, however, especially in those cases that have to be treated in places where the means of identifying the infecting microörganism are not available, it is a failure in most instances. The sera of patients suffering from one form of bacillary dysentery usually will not agglutinate other varieties of Bacillus dysenteriæ.

It is possible that Flexner's polyvalent serum might be used for any acute bacillary dysentery. However, streptococci, staphylococci, colon bacillus, and others concerned in the production of colitis under certain circumstances, will make the use of even a polyvalent serum unsatisfactory in many instances.

THE WET PACK IN THE TREATMENT OF INSOMNIA AND MENTAL DISORDERS.

The *Journal of Mental Science* for October, 1914, contains an article by RAYNER in which he says that the beneficial effect of the pack, and of the sleep induced by it, are so well known that they need no repetition. In febrile states they are evidenced by reduction of temperature and increased tone of circulation; by relief of symptoms in toxic conditions; and by general improvement in sleepless, exhausted, or excited nervous states.

The general improvement in nutrition is widely contrasted with the disorders and de-

fects thereof, following the use of narcotics. This general improvement has been very strikingly demonstrated by Maggiora (Venay and Maggiora, *Blätter f. Klin. Ther.*) in the results on the muscular system, who showed that the lifting capacity was considerably increased after a wet pack. When a cold dip followed the pack the lifting capacity was fully doubled.

Baruch, therefore, advises that the "tone" of the cutaneous vessels should be restored after the pack by a half-bath, a sheet-bath, a cold ablution, or the circular bath and douche of 70° to 80° F.

Light massage, especially effleurage, is of special service for this end.

When the pack is given at bedtime to induce sleep, these tonic procedures should be deferred until the morning.

The method of application of the wet sheet is to be found in every book on nursing, but there are certain details that require especial attention.

The speed with which the wet sheets and wrappings are applied is a very important point, greatly affecting the quickness and thoroughness of reaction.

The complete exclusion of air beneath the blanket cover, Baruch asserts, is of the utmost importance—on this, he says, "everything depends."

The application of warmth (by hot-water bottles, etc.) to the feet, especially during the cold stage, is also often of great importance; and equally important is the application of cold to the head by cloths, etc., in the stage of reaction.

The temperature of the water out of which the sheet is wrung should be carefully regulated by the medical attendants to the reactive capacity of the patient.

The medical attendant should himself observe, in the first packing, the circulatory effects, and be prepared to administer a stimulant in case of any extreme depression.

The duration of the pack has also to be carefully judged in relation to the object to be attained, and to the vigor of the patient.

The extent of the packing must be regulated on similar conditions. The whole pack, including arms, neck, and feet, may be reduced to the body pack (leaving out arms and legs), the abdominal pack, or even to the packing of both legs or one leg, which may be sufficient to induce sleep in some cases.

The thermometer may be used with advantage to guide the amount of the blanket covering. The normal skin temperature is the guide in this procedure. Flushing or copious perspiration of the head and face indicates a need of cold to the head and lessened blanketing, while coldness of the feet points to the need for increased covering, etc.

The use of the wet pack is obviously contraindicated in cases in which the increased pressure of blood in the brain and viscera is likely to be detrimental, as in cases of vascular degeneration, etc.

In cases of feeble circulation it is contraindicated, owing to the great derivation of blood from the skin. Hence, in organic heart disease, or even in functional weakness, it should be used only in a limited measure, and with great caution.

Ringer, in Tuke's Dictionary of Medicine, says that packing is contraindicated in the mania of general paralysis and epilepsy, and in acute primary dementia (anergic stupor). Other authors have barred its use in neurasthenia, hysteria, and allied states.

The writer's personal observation is that it may be employed with advantage in many neurasthenic and hysteric cases, but only by using it to a limited extent. In some cases of neurasthenia the packing of one leg may be quite sufficient.

THE TREATMENT OF HEART INVOLVEMENT IN SYPHILIS.

Brooks, in the *Journal of the American Medical Association* of October 24, 1914, reaches these conclusions:

1. Cases of heart involvement in early syphilis may be fully cured irrespective of the character of the lesion by vigorous specific treatment alone and independent of circulatory measures.

2. Even well-established and late cases usually respond to treatment with cure, or marked though perhaps temporary benefit.

3. In most tertiary instances, purely circulatory measures produce but slight benefit unless preceded by or combined with specific medication.

4. Interrupted or inefficient treatment establishes an immunity or resistance on the part of the lesions against the specific drugs employed. Hence the importance of vigorous and careful systematized treatment.

5. The most satisfactory treatment is one which combines the use of salvarsan with mercury and the iodides. Combined treatment may be unnecessary in early cases, but it is essential in late ones.

6. Salvarsan, preferably old salvarsan, produces in most instances the quicker results. It is capable, however, of inducing serious symptoms, and in untried cases of heart involvement it should be administered in small doses until its action has been ascertained, particularly in those lesions characterized by disturbances of rhythm.

7. Mercury alone may produce apparent cure. Best effects are secured with this drug when its form is from time to time changed. Its use appears to be indispensable in all well-established cases.

8. The iodides are valuable adjuvants in the treatment of these cases, especially in their late stages, but they are apparently without specific action.

9. Permanent injury to the heart must be assumed to have taken place in late cases, even though prompt response to treatment and apparent cure occurs.

10. Successful treatment rests primarily on the recognition of the cause of the disease and on its specific treatment.

BLACKWATER FEVER.

KIRKPATRICK, in the *Indiana Medical Gazette* for September, 1914, reports the case of W. H., a European, aged forty-three years, who was seen suffering from blackwater fever of two days' duration. Urine scanty, almost black in color, showing a mass of débris microscopically. The spectroscope showed the hemoglobin band. On the 23d, as the patient had not passed urine for nearly twenty-four hours, the writer feared that suppression of urine due to hemoglobin blocking of the kidney tubules would occur, and therefore decided to give an intravenous infusion, but as Sir L. Rogers considers that so-called normal saline solution is in reality hypotonic, it was decided to use Rogers's isotonic saline solution (NaCl Gm. 90, $CaCl_2$ Gm. 4) in order to avoid the possibility of increasing the hemolysis already existing. Two pints of Rogers's isotonic saline solution was infused into a vein of the forearm, and ten hours later 12 ounces of almost clear urine was drawn off. The urine, although darker than normal, was entirely different from the almost black urine previously passed, and it retained this character until the patient died a day or two later from exhaustion. The infusion of Rogers's isotonic saline solution apparently had a marked effect in averting the threatened hemoglobin blocking without increasing the hemolysis.

VACCINE THERAPY IN EYE DISEASES OF BACTERIAL ORIGIN.

MEDALIA, in the *Boston Medical and Surgical Journal* of October 22, 1914, says he thinks the following conclusions are warranted:

1. The use of vaccine in bacterial infections of the eye, if judiciously carried out, will yield results such as could not be obtained with any other method of treatment heretofore known.

2. Autogenous vaccine should be used as soon as possible.

3. In order to obtain good results optically as well, the vaccine treatment should be employed before permanent damage to the eye occurs.

4. When used in infections of the anterior chamber, especially in hypopyon ulcers, repeated paracentesis, if performed alongside of the vaccine treatment, will yield better results than when vaccine is used alone.

5. Small and oft-repeated doses will do away with marked negative phases and minimize the chance of a possible setback, both of which might occur if too big a dose is employed.

6. Vaccine if used in a prophylactic way

is of value in connection with preoperative immunization. It is of special value in cataract operations where the conjunctiva contains bacteria that cannot be gotten rid of in the ordinary way.

7. The bacteriological examination in connection with prophylactic immunization of all cases prior to cataract operations seems to the writer to be the logical method of procedure and will do away, to a great extent, with running the risk of postoperative infections.

THE ENEMA AND ITS USE IN CONSTIPATION.

The *Indianapolis Medical Journal* of October 15, 1914, contains an article by FOREMAN, in the course of which he points out that although the mechanical stimulation of high enemata may be reënforced by thermal and chemical stimulation, yet in constipation this practice is not free from danger, as by frequent repetition, which is often necessary in chronic constipation, of high stimulating enemas irritation or inflammation of the bowel may result. High enemas are usually more satisfactory when given with slightly tepid water, as the slight distention does not irritate the bowel, the fluid remains longer in the bowel, and, besides arousing peristalsis, also serves to soften the feces.

As has been said, high enemata should be given at a low pressure (3 feet). In cases of difficulty of passing the pelvirectal angle or a fecal mass the pressure should be increased, remembering, however, that too high a pressure may stimulate the "defecation reflex" or initiative peristalsis in the pelvic colon, and thus defeat the purpose of the enema by untimely expulsion. Likewise too high a pressure may weaken or paralyze the lower bowel by overdistention. It is necessary, however, that sufficient pressure should be used to prevent the escape of the liquid from the rectum, which may be prevented in some cases by pressing against the anus.

The position in giving high enemata is of little consequence so long as the recumbent posture is assumed, the liquid passing equally as well whether the patient be on his back or on either side.

The apparatus used is an ordinary irrigating reservoir, of rubber, glass, or metal, holding at least 2000 Cc. (2 quarts), connected by a soft-rubber tube with a rectal tip 10 cm. (4 inches) long, which may be used in the rectum, or it may be connected to the ordinary soft-rubber colon tube. It is quite probable, however, that when the full length of the colon tube, 40 to 60 cm. (16 to 24 inches) is introduced it coils upon itself and never reaches beyond the pelvirectal flexure. Equally good results are obtained, and in most instances better, with the rectal tip.

Low enemas are used where the principal effect desired is on the rectum and pelvic colon—*i.e.*, where there is pelvic and rectal constipation. The amount of fluid necessary to distend the rectum and pelvic colon is 200 to 250 Cc. (6 to 8 ounces); where no more than this amount of fluid is used it scarcely passes beyond the pelvic colon.

While low enemata act from their mechanical distention of the lower bowel, yet their principal action is due to the addition of substances to the enema which stimulate the bowel chemically, and from their thermal stimulation due to lowering the temperature of the liquid (as low as 60° F.). However, in spastic conditions of the lower bowel and in sensitive and nervous individuals, warm enemata act better.

The following substances when added to the low enema, containing from 200 to 250 Cc. (6 to 8 ounces) of water, soap solution, or normal salt solution, act as chemical stimulants to the rectum and pelvic colon:

1. Magnesium sulphate 30 Gm. (1 ounce).
2. Glycerin 30 Gm. (1 ounce) and magnesium sulphate 60 Gm. (2 ounces).
3. Whisky 15 Cc. (½ ounce).
4. Oil of turpentine 4 Cc. (1 drachm).
5. Purified oxgall 8 Gm. (2 drachms).

Since the purpose of the low enema is to produce immediate evacuation of the lower bowel, it should be given at a high pressure (five or six feet) in order to obtain the mechanical stimulation of sudden distention

along with the chemical and thermal stimulation. The most favorable posture is with the hips elevated or lying upon the left side. It is best given with gravity apparatus as in the high enema.

In case of impaction of the rectum with hard feces, the rectal enema is used. The amount of liquid used is small, 60 to 120 Cc. (2 to 4 ounces), and usually contains substances producing chemical irritation, such as glycerin, Epsom salts, whisky, bile salts, etc., or having solvent properties, softening the feces (see below). This amount is readily held by the rectum, so that it scarcely passes beyond the rectal flexure.

Pure glycerin is the best stimulating rectal enema. The amount used is 4 to 8 Cc. (1 to 2 drachms). Its irritant action depends on its hygroscopic power, attracting enough water into the bowel to induce a movement, and is of little value unless injected in a concentrated state. It sometimes causes tenesmus, in which case it may be added to an equal quantity of water. Or a more convenient way is the use of the glycerin suppository, 2 to 4 Gm. (½ to 1 drachm) of pure glycerin. In cases of spasm of the sphincter ani belladonna or opium may be added to the glycerin suppository, as in the following formula:

Glycerini, 1.00;
Extracti belladonnæ, 0.10;
Olei theobromatis, q. s.

M. fiat suppos. No. 1.

Enemas also act by softening the feces, which are subsequently removed either naturally or by stimulating enema. They may be given high, low, or rectal, depending upon whether the proximal colon, rectum, and pelvic colon, or the rectum alone, are to be affected.

A principle to be remembered in the use of solvent enemata is that they must be given in such a way that they may be retained. This means that they must be given slowly at low pressure; the liquid should be at body temperature or slightly above and should contain no chemical irritants, and in addition should have solvent properties.

Plain water or normal salt solution has been found to have the highest solvent powers, and to likewise have no irritating properties. From 120 to 1500 Cc. (4 ounces to 3 pints) may be used, depending upon whether the enema be rectal, low, or high.

ACETONE AND VOMITING.

The *New Orleans Medical and Surgical Journal* for November, 1914, contains an article by FENNER on the relationship between acetone and vomiting. His conclusions in regard to vomiting with acetonuria in children are as follows:

1. The vomiting, and not the acetone, is what should occupy our attention. The writer has seen case after case in which the vomiting was relieved; the symptoms of illness, and these are severe enough, had disappeared; the child was bright, and anxious for food, which was eagerly taken and assimilated, where the urine continued to be acid and to show quantities of acetone. With the resumption of normal functions the acetone disappeared also.

2. In many cases calomel is rejected, but inasmuch as only those who are very badly bitten by acetone will consider every case of vomiting to be an instance of acidosis, it is worth while to try the effect of fractional doses of calomel in the beginning. Soda is usually vomited, particularly if given in the large doses indorsed by so many authorities. At best, except in very weak solution, it is a nauseous dose, as can be demonstrated at the nearest soda fountain. If frequently repeated it becomes a positive irritant. The writer has seen children of two to two and one-half years of age, who could retain their food, such as condensed milk, but who would begin to retch the moment the nurse approached with the dose of soda. And yet the soda was continued!

3. The sovereign remedy for these cases of vomiting is morphine. It may be given hypodermically, or in the milder cases by mouth, in very small doses, combined with a tiny dose of cocaine, and a few grains of magnesia in a little chloroform water or plain water. Once the vomiting has been arrested, one may attempt to neutralize the acid condition with alkalies. Meanwhile

the agonizing thirst and the dehydration of the tissues must be dealt with. And since water is generally vomited as soon as it is taken, this indication is met by the Murphy drip. Here again the action of morphine is admirable. It is no easy matter to use the drip in children under two years of age. The rectum is irritable, and the extreme restlessness interferes sadly with its administration. During the slumber or drowsiness produced by the morphine, the rectal tube can be slipped in without arousing any protest from the baby, and the thirsty tissues eagerly absorb the life-saving fluid of which they have been drained.

4. During the height of the attack it is useless to try and give food by the mouth, but there comes a time when, with the resumption of bowel movement and the improvement of the other symptoms, some nourishment must be tried. In the writer's experience very dilute condensed milk, or malted milk, will be retained sooner than anything else. He has never had the temerity to try cow's milk first.

The writer recognizes the audacity of this attack upon the teachings of authority, but authors do not always practice what they preach, and the writer is convinced that much mischief has been done by the overshadowing importance which has been accorded to acetonuria, with the corollary that soda is its specific. If soda dosage were calculated as food calories are, the 180 grains a day which have been suggested for a 20-pound baby would be increased to 1350 grains for a 150-pound adult!

THE USE OF SCOPOLAMINE HYDROBROMIDE OR HYOSCINE IN THE TREATMENT OF MENTAL DISORDERS.

In the *Journal of Mental Science* for October, 1914, DANIEL says he is unaware whether hyoscinism has previously been described; if this is so, he has been unable to find any reference to it in the literature.

Severe hyoscinism is produced within three to six weeks when the drug is given in frequently repeated doses hypodermically, whereas by mouth it may be administered for as long as six months before the symptoms assert themselves.

So characteristic are the symptoms that it is a matter of but slight difficulty to diagnose the cases by their behavior, and without reference to their medicine cards.

The earliest symptom, which the writer has noticed, is an intense restless excitement, associated with vivid hallucinations; this is soon followed by rapid emaciation, and finally there is a well-marked paresis of various muscles, which doubtless if unrecognized would not long precede death.

The sensory disturbances are obviously of a very terrifying kind, and the motor restlessness is entirely dependent on them; the patient foams at the mouth, chatters incessantly, and is never still for a moment; when approached by nurses she fights them, under the impression that they are assisting in the awful events which fill the whole field of her consciousness. The most vivid hallucinations are those of sight, and subordinate to them are those of hearing.

As is only to be expected, the excitement is accompanied by a rapid loss of flesh, and the patient becomes a mere shadow of her former self. In one case the withdrawal of the drug was followed by a gain in weight of 2 st. 5 lbs. in eight months.

The motor nervous symptoms are well marked, and include muscular paresis and tremor, dilated pupils, increased knee-jerks, etc.; the staggering gait and ataxic movements recall a person in the early stages of alcoholic intoxication, while the speech is suggestive of general paralysis. The weakness of the legs is very evident, and they will with difficulty support the weight of the body.

The writer is unable to give any description of the pathology of this condition, because he has not seen a fatal result, but there cannot be any gross lesion, as the symptoms rapidly disappear when the hyoscine is withdrawn.

The indications and contraindications to the use of scopolamine hydrobromide need careful consideration, and one must differentiate between the two methods of administration, viz., hypodermically or by mouth.

Hypodermically, and in a single dose, the

only contraindication is the physical condition of the patient. One naturally avoids the use of so potent a drug in cases of heart disease, senility, etc.

Its administration in repeated doses hypodermically should be avoided. By mouth in an eight-hourly mixture hyoscine may eventually give rise to alarming symptoms, even when the dosage is small, but not with such certainty or severity as when repeated hypodermic injections are given; as a matter of experience, even with fairly large doses, such as 1/40 gr. given three times daily, the writer has on only one occasion seen paresis induced, although the other symptoms of hyoscinism, namely, hallucinosis, delirium, and emaciation, have soon been noticeable.

The liability to induce hallucinosis must also be reckoned as a contraindication to the use of scopolamine hydrobromide as a regular sedative for the insane, because the terrifying nature of the visions controverts its use as a form of beneficent treatment; patients indeed have not infrequently complained to the writer in such terms that it left no doubt that they dreaded the injection through fear of its effects.

Another restriction to its use has reference to the patient's mental capacity; imbeciles, for instance, are notoriously intolerant of alcohol, though particularly given to abuse it, and, similarly, with hyoscine one notices that among the more imbecile class of the insane there is a marked intolerance of this drug.

The emaciation induced by the drug when taken in repeated doses should also restrict its use in this way among the insane; among recoverable cases this objection is obvious; among chronic cases the emaciation and general debility associated with hyoscinism must lower the patient's resistance to the tubercle bacillus—and in any asylum population the risk of such an invasion is considerable.

It must be admitted, however, that all sedatives have certain disadvantages, and yet in spite of this they are necessary in the treatment of some cases. The writer, therefore, still prescribes hyoscine, but frequently changes it for some other sedative.

The treatment of hyoscinism is simple. The withdrawal of the drug leads to a rapid improvement, the delirium abates within ten days, the loss of weight is regained within six months, and the paresis passes off within a few weeks.

For the delirium of hyoscinism perhaps liquor opii sedativus in half-drachm doses gives the most satisfactory results.

Briefly then one can summarize the important points as follows:

1. The continued administration of scopolamine hydrobromide may give rise to characteristic symptoms of chronic poisoning.

2. Weak-minded epileptics appear to have a marked idiosyncrasy for the drug.

3. Careful watch should be kept on all patients taking hyoscine regularly, and undoubtedly the best test for any ill effects is the weighing-machine.

4. For acute excitement there is no drug so reliable as hyoscine when given hypodermically, but the doses must not be repeated indefinitely.

5. Lastly, there is no doubt that life may be endangered by hyoscinism.

INTERNAL USE OF RED IODIDE OF MERCURY IN ENLARGED MALARIAL SPLEEN.

DATT, in the *Indian Medical Gazette* for September, 1914, asserts that of all the counter-irritants to the enlarged spleen red iodide of mercury stands first in reducing it, although there are other counter-irritants of the same nature, but of inferior value in these cases. In Datt's opinion, red iodide acts not by its irritant action in these cases, but by absorption it produces certain changes in the system which cause increased leucocytosis, and thus it effects the cure.

Bearing this view in mind, Datt has been using this drug internally with marked success in several cases for the last two years. It reduces the spleen and improves the health of the patients. He has never seen any bad results from its administration. If it proves equally efficacious in other hands as it did in his, its use will make a consid-

erable reduction in the expenses of the dispensary and at the same time increase the comfort of the patient.

Datt uses this drug alone and only internally in the following way:

Red iodide of mercury, gr. 1/20;
Potass. iodide, gr. ij;
Aqua, dr. iij.

After two weeks he increases the dose to gr. 1/16 per dose.

On taking the blood counts, he has found that it increases leucocytosis. The earliest test seen it increased on the tenth day, when the leucocyte count rose from 1500 to 2500. The differential counts also show these changes. At first the large mononuclears are not increased, but afterward there is an increase of the large mononuclears with increase of the polymorphonuclears and of the small mononuclears.

Datt would suggest that this drug be tried in kala-azar cases.

He is experimenting with it in healthy men to find whether it increases leucocytosis, and will publish his results later on in these cases.

FIRST-AID USE OF ANESTHETICS IN THE GERMAN ARMY.

The *British Medical Journal* of October 10, 1914, states that Professor Schleich, whose name is associated with modern improvements in local anesthesia, has recently advocated the more extensive use of anesthetics in the field. He even goes so far as to urge the administration of anesthetics by every soldier, who should carry a small bottle on active service. Chloroform alone is too dangerous for the layman to give himself, while ether is apt to excite the patient, making him toss about and aggravate his wounds. Neither of these drugs should, therefore, be entrusted in the pure state to the soldier. Professor Schleich recommends the following mixture, the efficacy of which he has already tested in the present campaign. The mixture contains ethyl chloride, chloroform, and ether in the proportions of 20, 40 and 120. The man saturates a handful of cotton-wool with this mixture, and presses it to his nose and mouth while he breathes deeply. He quickly loses consciousness, and no longer being able to hold the cotton-wool to his face, the further administration of the anesthetic is automatically prevented; so Professor Schleich believes, but if the man were lying on his back this might not happen. The loss of consciousness is followed by a prolonged sleep, and when death supervenes it is, according to Professor Schleich, invariably due to the wound and not to the anesthetic.

THE INTRAMUSCULAR INJECTION OF ANTITOXIC SERUMS.

A strong plea for the intramuscular rather than the subcutaneous or intravenous injection of antitoxin serums is advanced by J. D. Rolleston and C. Macleod, who have employed it with success during the last six months in 339 patients with diphtheria. It is pointed out that the absorption of the antitoxin into the blood is, naturally, most rapid when the serum is given by intravenous injection; but the absorption after deep injection into the muscles of the thigh is only a little less rapid, and proceeds very much—from 3 to 20 times—faster than does absorption after subcutaneous injection.

The technique advised is very simple. Without preliminary washing the outer side of the thigh in its middle third is painted with a 2-per-cent solution of iodine, the needle is driven deep into the body of the vastus externus, and the injection is given in the ordinary way: 20,000 units, or 50 Cc., can be readily injected thus even in small children. Directly the needle has been withdrawn after injection the site of the puncture is again painted with iodine solution and a collodion dressing applied. The thigh is to be preferred to the gluteal region, not only because there is less probability of injuring important vessels or nerves, but also because the thigh muscles are much more compact and exercise greater pressure on the injected fluid, rendering absorption more rapid. No suppuration was noted after any of the 412 injections administered. On the other hand, the benefit of the rapid absorption thus obtained was shown by the

lesser incidence of post-diphtheritic paralysis, especially of a severe kind, in the patients treated by this method.—*Lancet,* Oct. 10, 1914.

THE TREATMENT OF DYSENTERY.

The *Indian Medical Gazette* for September, 1914, contains a communication by HEBBERT in which he expresses the view that his experience of dysentery is an unusual one, for of the many hundreds of cases he has had to treat he has only twice had to resort to ipecacuanha. At first he used to constantly find that certain severe cases did not seem to improve under the magnesium sulphate treatment; in fact, they seemed to get slightly worse. He noticed in these cases that on palpation of the left iliac fossa the colon could be felt in severe spasm. He then tried stopping all treatment for one day, giving 30 minims camphorodyne at night and then starting magnesium sulphate (one drachm every hour) from the next morning. He found in every case these severe cases at once made rapid recovery. His routine since has been to give magnesium sulphate (one drachm every hour) for three days. If the condition has not materially improved by this time, he resorts to rest for one day, camphorodyne at night, and then resumes treatment the next day. Under this routine he has in only two cases failed to get rid of all blood and mucus in less than two weeks. In these two cases there was marked improvement, but the mucus and slight diarrhea continued. This rapidly ceased with two or three 60-grain doses of ipecacuanha (preceded by 30 grains of chloral). The writer thinks the microscopical examination of the stools helps very little. He has never found amebæ, not even in the two cases which were cured by ipecacuanha. So he thinks a negative result as far as amebæ are concerned is worthless.

Hebbert cannot help feeling that a large number of dysenteries are diagnosed as amebic because they do not improve with magnesium sulphate, but would quickly improve under the above methods. He tried emetine, as he was told the cases of dysentery required it, but he has found they all, so far, get well, quite well, with saline.

While in England last summer the writer was told by the Resident Medical Officer at the Colchester Asylum that dysentery was very rife there and took a long time to cure. The writer suggested the magnesium sulphate treatment. The medical officer said he had tried it but found it of no use. The writer came then and tried himself. He found the cases were much severer than the average case in India, and that three days magnesium sulphate treatment did not improve the condition. He then tried the effect of one day's rest with chlorodyne or tincture of opium at night (full dose), and recommencing magnesium sulphate treatment next day. He found in every case very rapid improvement took place, and all cases were completely convalescent in less than a week.

The writer's own opinion is that when the colon is very acutely inflamed, as perhaps from some local ulcer, severe spasm takes place, so that complete flushing of the large intestine is prevented. .

THE INFLUENCE OF STARCH ON INFANT DIGESTION.

SOUTHWORTH, in the *Journal of the American Medical Association* of October 17, 1914, says that the rôle played by starch in the intestinal digestion of infants may be a diversified one. A survey of the growing use of starch in infant feeding forces the conclusion that whether its action is simple or complex, this action is in a broad sense protective, in that it allows the consummation of desired results, which with the same food, but in the absence of starch, are not obtainable. It would therefore appear that not only is starch tolerated and digested when given in moderation in the dietary of infants, but that it should be recognized as having a distinct field of usefulness in properly selected cases.

In the attempt to seek some rational explanation of the wide-spread use of cooked starch in the artificial feeding of infants, let us not confuse, as is so commonly done, the infant with a normal digestion and the

infant with a disturbed digestion. In the writer's experience, starch, as a rule, is unnecessary for the former before the seventh or eighth month. In the latter, however, it is often a remedial factor of great value. No sensible person would deny that relatively excessive amounts of starch have caused and always may cause, of themselves, disturbances of digestion, but instances of such abuse do not preclude its judicious employment.

In conclusion the writer may say that while it is an established fact that even young infants are prepared to digest moderate quantities of boiled starch, the indication for its use appears to lie in those suffering from disturbances of digestion and nutrition. With these, the chief end subserved by such addition to their food is not solely to nourish the infant, but to promote nutrition by making possible a more orderly digestion and absorption of its main nutriment, milk.

THE USE OF NEOSALVARSAN IN MENTAL DEFICIENCY.

In the *Glasgow Medical Journal* for October, 1914, FINDLAY reports four cases treated by neosalvarsan.

Each of these four cases was a very marked example of mental deficiency, three of them being frankly idiots. The treatment in all had a most salutary effect, and although it did not bring them up to a normal level, it made it possible for two of them to be educated, and to look after themselves. In milder cases, and especially if the treatment were commenced earlier, it might be possible to obtain complete cures. Unfortunately one of the children died, but so long after the cessation of the neosalvarsan administration that the writer does not think the issue can be ascribed in any way to the drug. It is more likely that the mischief, which had been progressive before the child came under observation, was arrested by the treatment, and that it, several months later, relapsed with the development of a gumma. Unfortunately no post-mortem examination was performed, and thus the writer's opinion can only remain conjectural.

Findlay concludes as follows:

1. Syphilis is a frequent cause of idiocy.
2. In syphilitic idiocy there may be no luetic stigmata.
3. Neosalvarsan when introduced intravenously or intramuscularly has a very marked effect in improving the mental condition.

ANTIMONY IN SYPHILIS.

MCWALTER, in the *British Medical Journal* of October 10, 1914, says that the true antisyphilitic drugs, according to Neisser, are those which have the power of killing spirochætæ. These are mercury, arsenical compounds, including salvarsan, and antimony. Concerning antimony, Neisser does not think there is any evidence yet of its efficacy in human syphilis, but he states it has a destructive action on the spirillosis of animals.

Neisser's view of the ideal drug is one which would combine arsenic, as in salvarsan, with mercury, and he considers it would be made still more powerful by the addition of antimony.

The whole world is now drenched with salvarsan, given mostly in heroic doses, and a reaction has set in. (1) Instead of the "therapia magna sterilisans" of Ehrlich, Neisser advocates a combination of drugs, in moderate doses, continued for over a year. He states that while a non-toxic dose of each drug may be given, the combined effect is powerful. (2) Some spirochætæ are affected more by mercury, some by arsenic, some are probably more affected by antimony. (3) Mercury and arsenic destroy spirochætæ in different ways. More modern views seem to suggest that the treatment of syphilis must consist not only in killing the treponemas, but in rendering the blood unfavorable to their reproductive functions, and resistant to the life-cycle of the infective organisms. The seed, the soil, the cycle, have all to be modified by therapeutic agents, and to suppose that any one drug could have such varied and opposing qualities is surely fantastic.

A substance called "antilutin" has recently been introduced by Tsuzuki. It is a compound of antimony oxide with potas-

sium tartrate and ammonium, and it is administered hypodermically in solution, about 3 grains being given in divided doses in four days.

The writer has used antimony in the treatment of syphilis for fifteen years, and it appears to be a drug of very considerable value for both the nervous and epithelial tissues.

It is worth noting that although Neisser states that there is no evidence that antimony cures syphilis in the human subject, Plummer's pill, which contains sulphide of antimony, has been in the Pharmacopœia for ninety years. It was claimed then that it had a specific action on skin diseases of a syphilitic type. The writer's experience goes to show that, whilst the curative effects of antimony on syphilitic lesions are very much like those of arsenic, it is distinctly milder in character, and seldom or never followed by optic neuritis or by the fatal effects attributed to arsenical compounds. It seems proper to analyze the therapeutics of each one of what Neisser classifies as antisyphilitics, in view of a very recent conclusion, after a careful analysis of all the fatalities by salvarsan, that "death by salvarsan is nothing less than death from acute paralysis of the circulation by arsenic. Theories which attribute catastrophes to impurities of the solution, alcoholism in the patient, injudicious selection of cases, or technical errors in administration, must be abandoned. Both salvarsan and arsenic are vascular poisons, acting directly on the blood-vessel wall, the blood itself, and the vasoconstrictor center, producing a circulatory stasis or local thrombosis and their associated symptoms." In Ireland, where famine or relapsing fever, one of the earliest diseases proved to be due to a spirillum, was unhappily frequent, antimony appears to have been given both in that disease and in typhus.

The writer has nothing miraculous to report about the effects of antimony in syphilis, except the fact that he has given it for many years, and absolutely without fatalities. He does not think it will cure syphilis if given alone, but it certainly assists the cure if mercury be also given. It appears to be particularly useful in the dermatological manifestations of the disease, and the cases which he has treated with it were notably free from nervous complications. He thinks the red sulphide—or antimonium sulphuratum—is the most convenient salt to employ. The dose should not exceed from 1 to 2 grains, but must be continued daily for two or three months—with occasional intermissions of a few days. It is, he thinks, a peculiarly useful drug in the fatal bronchopneumonia which carries off so many infants the subjects of inherited syphilis. Antimony was a panacea for almost every disorder in the seventeenth and eighteenth centuries. It cannot be denied that it had frequent good effects in various types of mania, and it seems safe to assume that many of them were of a syphilitic genesis, and it is fair to suppose that any beneficial effects were due to the spirillicidal properties of antimony.

FURTHER EXPERIENCES WITH VERATRONE IN THE TREATMENT OF ECLAMPSIA.

In the *British Medical Journal* of September 26, 1914, HAULTAIN reaches a further favorable report on this subject, and after relating several cases says that in a general survey the outstanding feature is the continuous presence of a raised blood-pressure, both in the women in whom fits had occurred and in those in whom the premonitory symptoms of an imminent convulsion were evident. As this also obtained in all the cases the writer previously published, one may therefore legitimately reason that a raised blood-pressure probably is one of the active factors in the development of convulsions—a contention which is corroborated by the fact that eclamptic convulsions are most prone to occur during labor, when the blood-pressure is greatly increased by labor pains.

That a high blood-pressure is the only or even the main cause of fits is not for a moment to be contended, as from the cases described it will be noted that subsequently to the injection of veratrone the blood-pres-

sure rose considerably higher than it had previously been, and yet no convulsions occurred. It may be assumed, therefore, that an eclamptic seizure is of a complex nature, initially due to the action on the brain centers of a toxin or a poison, which among other manifestations gives rise to increased blood-pressure, which may be considered as a potent factor in the active precipitation of the convulsion. With this theory in his mind the writer determined to try veratrone, as from a previous use of veratrum viride he had gotten beneficial results, due he considered to the marked fall in the blood-pressure with which its rise was attended.

In this direction the action of veratrone surpassed all expectations. Without exception, after the injection of 1 Cc. the blood-pressure was lowered markedly and rapidly, and almost in every instance with an immediate cessation of fits.

The depressant action is usually only temporary, extending over but a few hours. It is associated with a marked slowing of the pulse-rate and increase of the urinary secretions and diaphoresis, and in some instances vomiting, particularly when the pulse-rate falls below 55.

Through the kindness of Dr. Cramer, a number of experiments were made on cats, several of which the writer personally observed. From these the following conclusions were come to:

1. That in small doses it invariably causes marked fall of blood-pressure and a slowing of respiration.

2. No effect is produced on either after the vagi have been cut.

3. When the blood-pressure has been lowered, adrenalin and pituitrin still cause a marked constriction of the arterioles.

From these facts it may be assumed that veratrone stimulates the afferent fibers of the vagus, so that its effect is produced reflexly through the vasomotor center and not through the paralysis of the vasoconstrictor nerve endings or the muscular walls of the arterioles. By this means the diaphoresis is secured by the dilatation of the skin arterioles, and the diuresis by the removal of spasm in the renal blood-vessels.

It is more than probable, however, that it has a further action as an antidote to the eclamptic toxin, for, as has been shown on subsequent rises of blood-pressure, fits seldom occur. This is further supported by the comparative mildness of the action of the drug in eclamptics or pre-eclamptics, when compared with cases of simple increased blood-pressure, such as chronic Bright's disease. Here the injection of 1 Cc. gives rise to extremely anxious symptoms of severe vomiting and syncope, associated with the marked lowering of blood-pressure.

In eclamptics, on the other hand, the injection of 1 Cc. may be repeated frequently without any toxic effects becoming evident. The writer has now used this drug in the treatment of 17 eclamptic and markedly pre-eclamptic cases, with the inhibition of fits in every instance. One of the cases ended fatally, the woman having been the subject of chronic Bright's disease with edema for over a year, and had ten fits before the treatment was commenced.

The lines of treatment the writer has adopted have been the immediate injection of 1 Cc. veratrone, with the stimulation of diaphoresis by hot packs and, if possible, attempts at free purgation by calomel and jalap. The blood-pressure is carefully taken at frequent intervals, and if it rises over 160, ½ Cc. veratrone at once given. The diet, he need hardly say, is purely milk.

THE EFFICACY OF VACCINES IN THE TREATMENT OF CHRONIC DIPHTHERIA CARRIERS.

In the *New Orleans Medical and Surgical Journal* for November, 1914, WEIL reaches these conclusions:

1. Chronic diphtheria carriers exist.

2. The use of vaccines does have an influence in destroying the bacilli in chronic carriers.

3. The number of bacilli is markedly diminished by the use of vaccines, even where they do not entirely disappear.

4. Diphtheria vaccines, in spite of the toxins they contain, can be used in comparatively large doses without causing a rise of

temperature or other evidence of a general reaction.

5. There seems to be no relationship between the amount of local reaction and the efficacy of the treatment.

6. Large doses of vaccine seem more efficacious than small ones.

7. It is necessary to get a number of consecutive negative cultures before a cure can be said to be effected.

OIL-ETHER COLONIC ANESTHESIA.

GWATHMEY writes in the *Medical Record* of October 3, 1914, once more on this subject. He gives the following improved technique:

I. *Preparation of Patient.*—(*a*) A mild laxative the night before operation, avoiding all purging. On the following morning an ordinary soap-suds enema is given to assist the evacuation of the bowels. (*b*) Irrigation of the colon until the return is clear, three hours before the operation.

II. *Indications.*—(*a*) Especially indicated where the element of fear is in evidence, as in goitre cases. (*b*) In the very obese. (*c*) Bronchoscopy and gastroscopy. (*d*) All operations upon the respiratory tract, head, neck, and chest.

III. *Contraindications.*—(*a*) Whenever ether is contraindicated, except where the patient has been ill from a previous administration. In these cases it can be given with impunity. It can also be given in bronchitis, asthma, etc. (*b*) Pathological conditions of the lower bowel, colitis, hemorrhoids, fistula, etc. (*c*) When the patient complains of considerable rectal pain upon the introduction of the oil-ether solution.

IV. *Apparatus.*—(*a*) A small catheter and a funnel for the introduction of the oil-ether solution. (*b*) A Gwathmey rectal tube with which to flush or withdraw fluid from the rectum.

V. *Administration.*—(*a*) One hour before operation visitors should be excluded, the room darkened, and quiet maintained. The patient should not now be left alone. Then give per rectum: Chloretone, gr. 5-20; ether and oil, ää dr. 2-4. Or a suppository: Chloretone, gr. 5-20, or some other hypnotic of equal value. (*b*) Half an hour before operation, by hypodermic injection: Morphine, gr. ⅛ to ¼; atropine, gr. 1/200 to 1/100. (*c*) Twenty minutes before operation, give the oil-ether as follows: (1) Mixture for adults, olive oil, oz. 2; ether, oz. 6. (2) Mixture for weak, anemic patients, olive oil, 45-35 per cent; ether, 55-65 per cent. (3) Mixture for children, ether-oil 50 per cent.

Patient in bed in the Sims position. The catheter is well lubricated and inserted 4 inches within the rectum. The mixture is poured slowly into the funnel, at least five minutes being consumed in its introduction. Introduce one ounce of oil-ether solution for every twenty pounds of body weight, except for obese persons. The eight ounces should never be exceeded with any patient. If patient goes to sleep before required amount is given, stop.

VI. *Danger-signals.*—(*a*) Loss of lid reflex. (*b*) Stertor or embarrassed respiration. (*c*) Approaching cyanosis.

If any of the above signs are present, immediately withdraw two or three ounces of the mixture from the rectum. If the breathing is regular, with reflexes active, the patient will be relaxed and in surgical narcosis.

VII. *Postoperative.*—Immediate irrigation of the rectum with cold soap-suds, at the same time massaging the colon from right to left, thus expelling any liquid which may be left. Then introduce two to four ounces of olive oil and one pint to one quart of cold water. Withdraw tube from the rectum.

Further after-treatment, the same as after other forms of anesthesia.

Latest Technique.—Recently the technique has been still further improved by diminishing the amount of oil-ether mixture one-third to one-half. This has been accomplished by using paraldehyde as the preliminary. Paraldehyde has been employed as a hypnotic in many hundreds of thousands of cases in insane institutions and general hospitals. When employed in connection

with ether, it intensifies the action of the anesthetic, giving more complete relaxation without in any way affecting the pulse or respiration.

The prescription for this preliminary is as follows: Morphine alkaloid, gr. ⅛; paraldehyde, dr. 1; ether and olive oil, ää dr. 3½.

This one-ounce solution should be administered per rectum one hour before the operation instead of the chloretone. When this preliminary dose is given, the technique as outlined above should be followed, except that instead of a hypodermic this dose should be repeated for athletics, alcoholics, and patients weighing over 160 pounds. For the average patient do not repeat the dose.

One drachm of paraldehye used in this way is equivalent in anesthetic value to two ounces of a 75-per-cent oil-ether mixture. The writer now gives six ounces of the oil-ether mixture where he formerly used eight. When the paraldehyde is repeated, for the cases mentioned, he gives four ounces instead of eight. This procedure is so satisfactory that the writer never uses more than two drachms of paraldehyde for any patient. This paraldehyde mixture, when used as a preliminary to nitrous oxide and oxygen, renders any further addition of ether by inhalation unnecessary, gives a greater relaxation, and the ether and paraldehyde are not noticeable to the patient.

THE TREATMENT OF TETANUS BY ANTITETANIC SERUM.

The *Journal of Infectious Diseases* for September, 1914, contains an article by IRONS in which he well says that the prophylactic value of tetanus antitoxin is established, and needs no argument for its support. That tetanus antitoxin properly used may save the life of a patient in whom tetanus has already developed should be more generally recognized, and the treatment employed in every case at the earliest moment possible. Every hour lost before the giving of the antitoxin decreases the chance of saving life. By no means every case will recover, but certainly more can be saved than have been in the past five years, and there is every reason to anticipate that with a proper use of antitoxin a mortality considerably lower than the present will be obtained.

It is important that the full effect of the antitoxin should be obtained immediately, and this may be accomplished by giving, as outlined by Park, 3000 to 5000 units intraspinally and 10,000 to 20,000 units intravenously at the earliest possible moment after symptoms of tetanus appear. On the following day the intraspinal injection may be repeated. The blood remains strongly antitoxic for several days. On the fourth or fifth day 10,000 units should be given subcutaneously to maintain the antitoxin content of the blood.

It is doubtful whether the enormous doses given in some cases over periods of many days are any more effective than the more limited dosage outlined above, by which the maximum concentration of antitoxin in the body is attained at once. If only a small amount of antitoxin (3000 to 5000 units) is available it should be given intraspinally. Intraspinal and intravenous injections should be given with all the precautions usually employed for these methods.

The danger of immediate anaphylactic shock following intravenous and intraspinal injection of tetanus antitoxin has been suggested as an objection to these methods of giving the serum, but when we consider the relative rarity of fatal instances of such complications in the treatment of diphtheria either by intravenous or subcutaneous injections, and the grave prognosis in untreated tetanus, it is evident that the remote possibility of fatal serum disease should be given little weight in determining treatment.

This use of antitoxin in no respect replaces other necessary recognized nonspecific methods of treatment in tetanus. Surgical treatment of the site of infection should be instituted at once. The patient should be placed at rest in bed in a quiet, darkened room, and should receive sufficient sedatives to control convulsions, together with adequate supply of fluid nourishment, and attention to the elimination by kidney

and bowel. The necessity for large and continued doses of sedatives such as chloral or chloretone should not blind the physician to the possible danger of giving an overdose. The condition of the patient should be carefully watched, and a revision of the standing orders for sedatives made whenever symptoms suggest the decrease or increase of dose.

TREATING GELATIN CAPSULES WITH FORMALDEHYDE SOLUTION FOR IPECAC MEDICATION.

DE LANNEY in the *Military Surgeon* for October, 1914, writes of gelatin capsules treated with formaldehyde for enteric medication when giving large doses of ipecac in treating a case of amebic dysentery. The case was a stubborn one, that had been treated previously by ipecac medication and twice by the injection of emetine.

Having a record of failures by both methods, it was determined to try the combined method. To prevent the ipecac coming in contact with the stomach it was put in gelatin capsules previously treated with formaldehyde to render them insoluble in an acid medium.

Number 00 gelatin capsules were soaked for a few hours in a 20-per-cent solution of formaldehyde and then dried. They became very brittle and somewhat distorted, but not enough so to prevent their subsequent filling. They were then filled with 1 gramme of powdered ipecac.

This method of giving ipecac proved very satisfactory in this case and there was no nausea. The case improved very rapidly under the combined treatment, and the stools soon dropped to one a day. The combined method of giving 1 gramme ipecac t.i.d. and emetine 1/3 grain twice a day for three days, then increasing to 2/3 grain for six days, seemed to act very much better than when either the ipecac or the emetine treatment had been given previously, the patient gaining five pounds during the treatment and suffering no inconvenience.

The treatment of gelatin capsules with formaldehyde is not original with the writer, though it has been used by him for over a year.

THE FREIBURG METHOD OF DAMMERSCHLAF OR TWILIGHT SLEEP.

In the *American Journal of Obstetrics* for December, 1914, KNIPE tells us that the drugs employed at Freiburg are morphine muriate in one dose of 0.01 gm. for the first injection, which is never repeated, except under most unusual conditions. This is used in solution and is prepared by the hospital pharmacist and kept in a ground-glass-stoppered bottle. In the Siegel method they use narcophin (narcotin-morphine meconate) manufactured by Boehringer & Soehne, Mannheim, Germany, of which the first injection consists of 0.03 gm. (½ grain), and the later doses half this amount. The drug is supposed to have less depressing effect upon the respiratory center of the mother and child.

Another drug that is occasionally used is pantopon in doses from one-sixth to one-third of a grain, to be repeated with extreme caution. Among those who have worked continuously in this twilight sleep, morphine muriate in one single dose is preferred. The writer has used all of these drugs for twilight sleep, and has obtained the best results with the morphine solution.

Scopolamine hydrobromide, the other component drug of the method, is obtained from the scopola plant, and while chemists maintain that hyoscine hydrobromide is identical with scopolamine, hyoscine is obtained from the hyoscyamus plant.

At Freiburg they use only the scopolamine. It is difficult to get a stable preparation of this drug. Most watery solutions quickly decompose after sterilization, so that in a few days it not only does not give the effect expected, but produces secondary effects that are frequently undesirable and even dangerous. This decomposition forms, according to Gauss, a by-product, apoatropine, which is toxic and has produced most of the bad results quoted by Hocheisen and others. A test for this decomposition of scopolamine was reported by C. G. Kessel, and consists of adding a drop of a thin permanganate of potash solution to the solution of scopolamine, when if there is any apoatropine present, it shows itself by the

production of a brownish-yellow color; this test is very delicate.

To prevent the decomposition of scopolamine, Professor Straub of Freiburg added 10 per cent of the sexatomic alcohol mannit to the solution. This preserved the solution, when properly cared for, for a long period of time—several years.

Preparation of the Scopolamine Solution.—A 10-per-cent solution of mannit in distilled water is made and filtered, to which is added scopolamine hydrobromide (Merck) in sufficient quantity so that 1 Cc. of the solution will equal 0.0003 gm. scopolamine. This is then sterilized in a flask in a steam-pressure sterilizer, after which glass ampoules, made of Jena glass 1 Cc. capacity, are filled by means of a sterile hypodermic syringe. The ampoules are then sealed and again subjected to steam-pressure sterilization for three-quarters of an hour. The drug prepared in this manner will not decompose and is stable. For hospital use it may be sufficient to keep this scopolamine solution prepared with mannit in 15-Cc. glass-stoppered bottles, sterilized by steam pressure.

To properly carry out twilight sleep requires the use of a special chart, on which the time, the number of injections, the symptoms of the patient, memory tests, the fetal heart, the mother's pulse, etc., are noted.

At Freiburg and elsewhere there have been over 8000 cases of twilight sleep with very excellent results, both for the mother and for the child. A few, however, reported bad results. These were, in great part, due to faulty preparations of the drug and to the desire of the obstetrician to change the Gauss method according to his own insight.

There are certain disadvantages in conducting twilight sleep. It requires the constant presence of a nurse skilled in this treatment, or better, the constant attention of a physician, who must give all his time to that particular patient. On this account it becomes essentially a hospital proposition. It is not easy; it requires experience in the method; and above all, it requires a greater obstetrical knowledge than is in common use, because the patient's outcries do not force interference by the physician where it may be indicated. Again, as the scopolamine is so prone to decompose, unless specially prepared, it is possible that physicians may use a drug improperly prepared and may get therefrom bad results. And the uninitiated physician, who is accustomed to give much larger doses of morphine, may find it difficult to use as little as is necessary in twilight sleep. Again, if twilight sleep is to be properly carried out, it requires attention to many details, such as stopping the ears, covering the eyes, darkening the room, preserving of quiet, protecting from bright lights, etc.; this may be difficult of accomplishment in many places, especially where a large number of patients are being treated at one time. However, to those who have seen the advantages of a properly conducted twilight sleep, it will be worth while to take all these cares and precautions, to have the environment proper, to have stable preparations of the drug, and to give it that personal attention and individualization which is absolutely esesntial if the best results are to be obtained.

The production of a proper twilight sleep requires not only a technical knowledge of the method of using scopolamine and morphine, but also good obstetrical judgment based on an adequate understanding of obstetrical forces and conditions. It is for this reason that the method is best used by the obstetrician himself. It is easier to train a good obstetrician in the method of twilight sleep than it is to make a good obstetrician out of one who may know the method of induction of twilight sleep.

The relationship between obstetric knowledge and twilight sleep is so close and intimate that one cannot turn over a case to an anesthetist for this purpose, as one would in a surgical operation. In some cases it may be necessary for the physician to interfere with the process of labor without loss of time, and the best results are to be obtained only by a prompt recognition of the obstetrical necessities combined with a good training in the use of scopolamine.

TUBERCULOSIS OF THE LARYNX.

LACK in the *Clinical Journal* of December 2, 1914, reminds us that the treatment of tubercular laryngitis requires the greatest care and judgment. There is no routine method of dealing with it. Remembering that the laryngeal complication is merely an extension of the pulmonary trouble, the first aim of treatment is to improve the general condition of the patient. There is little doubt that all those methods of treatment which are combined under the term "sanatorium treatment" have proved of the greatest advantage and have greatly improved the prognosis. Other forms of treatment, such as tuberculin injections and local treatment, may be carried out simultaneously. So far as the writer has seen tuberculin treatment has not been a success in cases of laryngeal trouble unless combined with general treatment on sanatorium lines. In addition to general treatment strict silence should be enforced whenever there is any ulceration or acute inflammatory infiltration in the larynx. The patient may be allowed to whisper a little, but it is better that he should write, and at the same time all useless cough should be prevented. In cases of early phthisis or of arrested disease the nose and throat should be examined and any abnormality corrected. It is important do deal radically with any such condition as nasal polypus or sinus suppuration, and even a simple condition like a deflected septum when causing nasal obstruction. It is better when possible to operate under a local anesthetic. It is best to wait until as the result of sanatorium treatment the patient's general condition is definitely improved; then an operation followed by further treatment is usually beneficial.

The local treatment varies according to the lesions.

Tubercular tumors should be removed with cutting forceps or curette, or destroyed by cauterizing or by caustics under local anesthesia. If it is possible to deal with them in this way the patient may be anesthetized and the growth dealt with, preferably with the cautery, by the aid of suspension laryngoscopy.

The superficial ulcer of the vocal cord may be treated in a similar way. If there are fleshy granulations they should be lightly curetted, and then the base of the ulcer thoroughly rubbed with chromic acid or nitrate of silver fused on a probe. In milder cases, or as a subsequent application to an ulcer which is slow in healing, lactic acid may be applied. It is best to apply the undiluted acid under local anesthesia.

The condition of fleshy granulations on the vocal cords should also be curetted, or the growths picked off with cutting forceps and subsequently cauterized or caustics applied.

When there is edematous infiltration of the arytenoids and epiglottis without ulceration, great care must be exercised. The writer thinks only those cases should be selected for local treatment in which the disease in the lungs is early or seems arrested and in which the patient's general condition is good. If these conditions are fulfilled the larynx should be cauterized under local anesthesia. The galvanocautery is the best form of treatment; a sharp point should be used, and it should be plunged deeply into the infiltrated tissues. Three or four deep punctures may be made at each sitting at intervals of not less than ten or fourteen days. The effect of this treatment in suitable cases is often extremely good and commonly hastens their cure. Similar treatment may be carried out when there is ulceration of the arytenoids or of the epiglottis, if all other circumstances are favorable. Caustics, with which must be classed lactic acid, must never be indiscriminately applied. If the patient's resisting power is not good they merely cause rapid spread of the ulceration, weakened infiltrated tissues breaking down without any tendency to heal. If the epiglottis is edematous and ulcerated and it is apparently the only part affected, it should be removed under cocaine with the punch forceps.

Those cases must now be considered, unfortunately still the large majority, for which no curative measures are indicated.

These include all those in which there is advanced or progressive disease in the chest, as well as the large majority of those in which the disease involves the arytenoids and epiglottis. Palliative measures must be directed chiefly toward relieving the dysphagia and the pain. If the dysphagia depends upon an ulcerated or edematous epiglottis it should be removed. The relief to the dysphagia is usually immediate, and the general condition consequent upon the regained ability to take plenty of nourishment usually improves. Even if the disease steadily progresses both in larynx and lungs, the removal of the epiglottis may relieve the dysphagia throughout the course of the disease. Pain is often relieved by the same operation. If removal of the epiglottis fails or is not indicated the local application of orthoform should be tried. This is a light insoluble powder which produces an anesthetic effect upon ulcerated surfaces. It may be blown into the larynx once a day, preferably half an hour before the first good meal, and will often relieve the pain for twelve hours. The patient may be taught to insufflate himself by means of a Leduc's tube. If in spite of this there is much local pain opium should be given in sufficient doses. The food should be carefully attended to, soft solids and thickened fluids being most easily taken.

In rare cases tubercular infiltration of the cords or ventricular bands may cause laryngeal obstruction and necessitate a tracheotomy. This operation should always be avoided if possible. It impairs the power of coughing and of expectoration, and often leads to rapid extension of disease in the lungs. Where there is laryngeal obstruction, however, it must of course be performed, and then it will probably be best to carry out extensive cauterization immediately so as to reduce the swelling and enable the patient to dispense with the tube at the earliest possible moment.

In conclusion, although tuberculosis of the larynx can no longer be regarded as the hopeless condition it was formerly considered, it is too soon yet to look upon it as the easily curable affection some laryngologists would apparently have us believe. It is a very great advance to be able to cure 15 to 20 per cent; but whilst 80 per cent at least end fatally, there is still much more to be done before we can regard the treatment as at all satisfactory.

THE INTRADURAL ADMINISTRATION OF MERCURIALIZED SERUM IN THE TREATMENT OF CEREBRO-SPINAL SYPHILIS.

The *Journal of the American Medical Association* of December 19, 1914, contains an article on this subject by BYRNES.

1. While it is not declared that mercurialized serum alone is the only treatment that is necessary in syphilis of the central nervous system, the writer believes it is equally, if not more, efficacious than salvarsanized serum in the local treatment of these diseases.

2. The immediate reactions following its administration are, in general, not so severe as those after the use of salvarsanized serum, and the cell count in the spinal fluid appears to be more quickly reduced.

3. Since preliminary medication is not required, the blood may be obtained at any time; and because of the greater stability of the mercurialized serum it may be prepared at leisure and kept in sealed flasks until it is convenient to administer it.

4. In certain cases of cerebrospinal syphilis in which the Wassermann test is negative, but in which there are all the indications for intraspinal treatment, it has impressed the writer as unfortunate that the patient had to be subjected to the discomforts of an intravenous administration of salvarsan merely for the purpose of securing a preparation for intradural injection. This objection does not arise in the use of mercurialized serum. It is true that in many cases both the blood and spinal fluid show evidences of infection, and in such instances the writer has not felt that the intravenous dose of salvarsan could be justly withheld, so that he has frequently given the combined salvarsanized and mercurialized serum intraspinally.

5. Owing to the greater stability of the

mercurialized serum, it is hoped that a method may be devised by which a permanent preparation can be dispensed in sealed ampoules and thus simplify the whole technique of intraspinal therapy. While it may be unwise to entertain the idea of using a foreign serum, it is not unlikely that human serum may be obtained in sufficient quantities for this purpose.

NEW GROWTHS INVOLVING THE TERMINAL BILE AND PANCREATIC DUCTS.

CROHN (*American Journal of the Medical Sciences,* December, 1914) observes that the introduction of methods of obtaining and analyzing duodenal contents, aspirated from the upper part of the small intestine by means of the duodenal tube, has made possible a means of diagnosis hitherto unrecognized.

Chemical investigation of the contents of the duodenum gives definite information of the patency or non-patency of the bile and pancreatic ducts. Tumors of this region usually completely obstruct one or both of these ducts, while other pathological conditions do not entirely obstruct. Hence complete absence of bile or pancreatic ferments from the duodenal contents determines the diagnosis of new growths in this region. In one-third of all cases the common bile-duct does not traverse the head of the pancreas but runs along the posterior surface of this organ to enter the duodenum separately or in conjunction with the excretory duct of the pancreas. In the other two-thirds of the instances the common bile duct in its terminal portion passes through the substance of the pancreas, from which it emerges, to enter in an oblique direction the wall of the second portion of the duodenum, traversing the thickness of the gut at this point for an area varying from a few millimeters to 1 or 2 cm. The bile duct may now penetrate the intestine and open alone into the duodenum, or, as is more common, it may unite with the pancreatic duct, thus forming a common channel, the ampulla of Vater. This ampulla is only a few millimeters in length and breadth and opens into the lumen of the second part of the duodenum, less often directly or more usually through a small knob of tissue, the papilla of Vater, which projects inwardly from the mucosa of the intestine.

One-third of all new growths of the bile ducts arise in the lower or terminal portions of the choledochus. Growths originating here are practically always carcinomata. They are small white or pinkish tumors which early encircle and constrict the lumen of the duct, causing complete obstruction to the passage of bile. The duration of this form of carcinoma is five to six months. Local glandular metastases are frequent, involving the lymph nodes on the posterior surface of the head of the pancreas and those in the pancreaticoduodenal angles. The symptoms are those of gradually increasing and unremitting jaundice, associated with loss of weight and cachexia. In this type of case the gall-bladder is usually firm and globular and distinctly palpable. The stools are acholic.

Carcinomas arising in the ampulla of Vater are rare, usually papillary and small, and block the two large ducts, causing absolute biliary as well as pancreatic stasis. Death takes place within nine months from cholemia or emaciation. In about 20 per cent of cases secondary growths occur in the liver. Neoplasms in the duct of Wirsung are rare. Complete obstruction of both the bile and pancreatic systems is present. The duodenal surface of the papilla of Vater is a more common origin for growth if not the most common. These forms of the so-called circumpapillary tumors vary in size from that of a pea to that of a cherry, taking the form of an excavated or eroded ulcer with raised, thickened, overhanging carcinomatous walls. Erosion hemorrhages are common, as are suppurative cholangitis and multiple hepatic abscesses. The period of survival is from seven to fifteen months. The symptoms are those of obstructive jaundice associated with diarrhea, melena, and emaciation or sepsis. The icterus may be intermittent or progressively continuous. New growths

arising from the duodenal mucosa exhibiting the so-called circumpapillary ones are rare. Sarcomata here are characterized by diffuse infiltration of the walls of the duodenum, dilatation rather than constriction of the intestinal lumen, ulceration, and hemorrhage. Primary carcinoma of the head of the pancreas is fairly common. It is of slow growth and is characterized by the symptoms of gastric disorder, pain, emaciation, and weakness, with obstructive jaundice and fatty diarrhea when the ducts become involved.

Exclusive of carcinoma arising in the head of the pancreas itself, carcinomata of the other five types have this in common: they grow slowly, increase gradually by extension, involve only the regional lymph nodes directly adjacent to the head of the pancreas, and form distal metastases (practically only in the liver) late in their course.

The remarks of Letulle, in 1906, should be quoted in full, as they most succinctly and clearly point the way to the most reasonable management of these cases:

"All observers note the striking contrast between the gravity of the secondary disorders and the minimal volume and relative benignity of the causal lesion, circumscribed as it is to the zone called by Hanot the pancreatic-biliary pylorus. They have all regretted not having called upon modern surgery for an early interference."

Radical operative procedures have been attempted since the year 1900. Twenty-three cases operated upon have been collected by Clermont, in 1913, and the names of the surgeons include some of the most illustrious of our times—Czerny, Körte, Riedel, Kraske, Cuneo, Mayo, Halstead, and others. The operations have consisted for the most part in an attempt to remove locally the new growth with or without the surrounding duodenal wall. Cholecystenterostomy as part of the operation has often been performed.

Locally, three different procedures have been attempted:

Simple papillectomy. This operation has been carried out in eight cases, with the following results: death following operation within eleven days, three; within eight weeks, one; death from metastases (after eighteen months), one; alive at time of writing, three (one six months, one six and a half years, one one and a half years).

Papillectomy with partial excision of the duodenum (10 cases): Died within a few days of hemorrhage or infection, four; died of metastasis (eight months to two and a half years), five; alive and well two years after operation, one.

Papillectomy with complete resection of duodenum (three cases): Died within a few days of operation, two; lived nine months after operation (died from secondary procedure necessitated by cholangitis and hepatic infection), one.

Several facts are apparent from a review of these figures:

The operative mortality is high (43 per cent).

Death from metastases is frequent (28.5 per cent); death from subsequent infection and other causes occurs (10 per cent).

Four cases had remained alive, at the time of Clermont's publication, from six months to six and a half years (19.5 per cent).

In spite of the apparent disproportion between the number of cases that have succumbed and those that have survived, the latter statement outweighs in importance the former, for it embraces in itself the hope of the future. Increasing surgical skill, earlier diagnosis, and a better acquaintance with the pathological processes that occur here undoubtedly will, before long, bring vastly improving and more gratifying results.

Kausch, after operating upon three such cases, has suggested and once performed a two-stage operation of the following nature:

First stage. Preliminary cholecystenterostomy. This operation relieves the jaundice, improves the nutrition of the patient, and helps to overcome the tendency to hemorrhage at the subsequent laparotomy.

Second stage. Radical excision of tumor, duodenum, and involved head of pancreas; blind closure of upper end of duodenum; implantation of ablated head of pancreas

and common bile and pancreatic ducts into lower end of duodenum; gastroenterostomy.

Cotte had previously suggested this operation, all in one stage, but subsequently modified his views and proposed the same procedure in two stages.

This two-stage operation will in the future probably become the operation of choice. Though a common practice, it is futile for a physician who makes the diagnosis of "cancer of the head of the pancreas" to resign himself and the patient to the attitude of "there is nothing more to be done." He should remember and understand that a large majority of the so-called tumors of the head of the pancreas are really small localized growths of the common bile duct, ampulla, or papilla of Vater. The greatest number of patients suffering from this disease enter the hospital two or three months after the onset of jaundice. The intervening time has usually been spent by the physician in waiting to observe whether a suspected stone will pass or not. This is the period most valuable for the patient. The proper procedure to follow in a person over middle age who becomes deeply jaundiced, whether painlessly or not, is to attempt immediately to discover, by means of the duodenal tube, whether the main ducts in the region suspected are absolutely blocked or not. If they are, one or both of them, the diagnosis of new growth should be made; the case should at once become a surgical one, and no further time be spent in "watchful waiting." A cholecystenterostomy at this time will be of greater assistance to the patient and prevent the dire consequences of a fully established malignant icterus. The mortality of this preliminary operation would probably be very much lower at this time than when performed months later.

Four to six weeks may safely be allowed to elapse. The nature of the growth permits of this delay, for it grows but slowly and has little tendency to give rise to metastases. With more assurance and a much better hope of success the second stage of the operation may then be undertaken. The successful issue of the radical excision of new growths involving these large ducts will rest in great part on the alacrity with which the physician makes this early diagnosis and calls to his aid a competent surgeon.

THE FUNDAMENTAL PRINCIPLES INVOLVED IN THE USE OF THE BONE GRAFT IN SURGERY.

ALBEE (*New York Medical Journal,* Jan. 2, 1915) states that the duration of cellular life, which under favorable conditions may be quite independent of organic or somatic life long after detachment from the living organism, depends largely upon the means of preservation of the detached part; or, in the case of organic death, the preservation of the whole cadaver; also upon the amount of disintegration from the cause of death. The higher the specialization of the cell, the less marked are its resisting and proliferating powers. The most favorable tissues for grafting purposes are the simpler connective tissues. Autogenous grafts are by far the most trustworthy. With primary union and in the absence of infection, if properly contacted, they are always successful. Infection does not necessarily indicate failure. Homoplastic grafts, when composed of the lower order of tissues, may be successfully employed, though not with the same certainty as the autogenous. When they are of the more highly specialized tissues failure results. There is also danger of transmission of disease. The heteroplastic graft usually dies when implanted into man.

In bone transplant nature is confronted with the following problems: (1) The rapid establishment of cellular nutrition and blood supply; (2) union of the graft to the contacted bones or fragments of bones by osteogenesis on the part of the graft or recipient bone, or both; (3) through Wolff's law, the adaptation in form and increased strength of the graft to its mechanical requirements. The surgeon can aid nature by minimizing trauma, by the protection and preservation of the graft bed and graft; by arranging the skin incision so that it will not lie directly over a superficially placed transplant; by excising, if possible, extensive scars from the field of

operation; by closely fitting and contacting bone surfaces, which should whenever possible include the accurate coaptation of periosteum of graft to periosteum of recipient bone, cortex to cortex, endosteum to endosteum, and marrow to marrow; by properly suturing muscle origins and insertions to the proper mechanical locations on grafts which replace skeletal bones or portions of them; by securing sufficient hemostasis in the graft bed; by including in the graft the periosteum, endosteum, and marrow.

The bone contact should be of generous extent, and always to healthy vascular osteogenetic bone; the more unfavorable the bone, the greater should be the area of contact. Often early bony union is aided by the interposition of numerous small grafts or fragments of bone. The proper contact of the bone elements can be secured only by the employment of the inlay principle, the modifications of which meet practically all mechanical requirements. A thorough understanding of Wolff's law is imperative; every change in the form and position of the bones, or of their function, is followed by certain definite changes in their internal architecture, and by equally definite secondary alterations of their external conformation, in accordance with mechanical laws. The influence of this law upon the success of bone-grafting procedures of all kinds cannot be too strongly emphasized. It not only causes the graft to proliferate and strengthen to an almost unlimited degree, if the new mechanical environment of the graft requires it, but also causes the bone from which the graft was removed to be restored to its original strength, and brings about internal reconstruction of the trabeculæ and the general histological character of the bone. A graft should be used as soon as possible after its removal. In the author's experience sterile petrolatum has proved a most satisfactory preserving medium. The graft should be either immersed in a jar of petrolatum or wrapped in gauze smeared with it and placed in cold storage at a temperature of 4° to 5° C.

An unabridged enumeration of the indications for the employment of the bone graft would be most difficult, and a tabulation of its general and more specific indications serves only as a suggestion of its broad field of usefulness. Its trustworthiness as a surgical agent is proven by Albee's success with it in more than 350 cases; by careful study miscroscopically, macroscopically, and by the *x*-ray of its results when used experimentally in the presence of primary union and even sepsis. Its field of usefulness is enlarged by the use of motor-driven instruments. By the use of the motor outfit in conjunction with kangaroo tendon, he has been able to avoid entirely during the past two years the use of all metal in the form of screws, nails, Lane's plates, wire, etc., for internal bone fixation purposes. This has been possible by making use of well-known fundamentally mechanical devices, such as bone inlays, wedges, dowels, tongue and groove joints, mortised and dovetail joints. Recognition and full appreciation of the important conclusions of Wolff constitute the treatment of deformities and the application of grafts of all kinds.

GONORRHEAL ARTHRITIS.

CHIARI (*Centralblatt f. Med. u. Chir.*, September, xviii, No. 5, 1914) states that gonococci are seldom found in the effusion in the joint after the acute stage is past except in the more malignant type with involvement of the myocardium. Chiari tabulates 443 cases in which vaccines were used in treatment, either autogenous or commercial. Of these 367 were cured, 32 patients were improved, and in 42 cases there was no improvement. In 16 cases antimeningococcic serum was employed instead of a vaccine, and 13 of the patients were cured. In 1911 Ramond reported successful autoserotherapy in five severe suppurating cases; he injected several times from one to five Cc. of the fluid obtained by puncturing the joint. The injection was made subcutaneously near the joint in question. Maillet and Constantinescu have

had similar experiences with hydrarthrosis. Vaccine therapy together with stasis hyperemia and superheated air give promise of improvement even in desperate cases.—*Urologic and Cutaneous Review,* December, 1914.

AMPUTATIONS IN WAR SURGERY.

FITZMAURICE-KELLY (*Lancet,* Jan 2, 1915) describes a method of amputation which he says was first suggested by himself and is now widely practiced in the military hospitals of France by British and French surgeons. The chief conditions calling for amputation in the present war have been compound comminuted fractures and gaseous gangrene, the latter one of the most probable complications in the early days of conflict, but apparently diminishing with the advent of colder weather. In both of these a virulent infection is present, and ordinary amputations are very frequently followed by recrudescence of the infection in the flaps. Further, the mortality following secondary amputations has in the past been high. It is impossible to make even a guess at the figures for the present war, but on the combined statistics of the Spanish-American and Boer wars Lagarde states it as 42.5 per cent in the case of the thigh and 21.2 per cent for the leg. In the present war the figures would probably be higher.

It has long been recognized that in war surgery amputation flaps should be cut rather short, and in the present war the French surgeons soon found that it was better not to stitch them at all, but to pack gauze between the flaps. The method advocated by Fitzmaurice-Kelly consists in a simple circular division of all the tissues, including the bones, at the same level, and that level the lowest possible. The skin is divided by a circular sweep, the muscles are divided at the level to which the skin retracts, and the bone is then sawn at the same level. The bleeding points are secured and tied, the nerves pulled down and cut short, and a dressing is applied to the raw surface of the stump.

The stump is not painful if care has been taken to shorten the nerve and there is very little shock. Most surprising of all, it can be performed at the margin of gangrenous tissue without, apparently, any danger of the gangrene spreading to the stump; in one case of massive gangrene reaching the middle of the upper arm amputation was performed half an inch from the gangrenous tissue, and the stump remained healthy. The chief disadvantage of the method is that a second operation is necessary, but this can be postponed until the infection of the wound has disappeared, and can be undertaken in conditions wholly favorable as to time and place. It is regarded by Fitzmaurice-Kelly as an inconvenience rather than as a contraindication.

DISLOCATION OF THE SEMILUNAR BONE.

RUNYAN (*Surgery, Gynecology and Obstetrics,* January, 1915) reports on eight cases of this accident which were treated in the Ancon Hospital, and include all of the cases of the past six years, covering approximately one hundred and twenty thousand admissions. He quotes Codman to the effect that the articulations above and below the proximal row of carpal bones account for all of the mobility of the wrist in both extension and flexion, and that each group of articulations is responsible for ninety degrees of motion. In either complete flexion or extension the axis of the os magnum forms an angle of ninety degrees to the long axis of the radius, while the interposed semilunar forms an angle of forty-five degrees with both bones. In this position the semilunar is at a mechanical disadvantage, because only the narrowest part of it is in the axis of force, and any increase of the tension beyond the normal has a tendency to squeeze it out of place. The method of reduction which the writer has employed is the same as that recommended by Codman and Chase, and consists of traction upon the hand and hyperextension of the wrist, and, while counter-pressure is made over the dislocated bone on the anterior surface of the wrist, the hand is brought over into com-

plete flexion. Should this precedure fail, it is necessary to cut down upon the semilunar and either reduce or excise it. Of the five open operations, two were reductions and three were excisions. In no case has he excised any part of the scaphoid. An anterior incision between the flexor tendons of the wrist was used in all instances.

INFLUENCE OF INHALATION ANESTHESIA ON ACIDITY OF BLOOD AS DETERMINED BY ESTIMATION OF H-ION CONCENTRATION.

CRILE (*Annals of Surgery,* January, 1915) notes that among the products of the transformation latent in the kinetic energy are acids which under normal conditions are neutralized into harmless compounds which are eliminated by the kidney. It is vitally necessary for the body to maintain a large margin of safety against acidosis by the presence of alkaline salts and bases which are derived from food. For the maintenance of its normal state of alkalinity the body is dependent mainly upon the liver, and perhaps secondarily upon the suprarenals and the thyroid. When the liver is excised the blood in a few hours becomes acid. When the suprarenals are excised the alkalinity of the blood is maintained for a longer period, perhaps twice as long, but it then becomes acid, and in each case the acidity of the blood is the close precursor of death. The excision of no other organ in the body produces this tendency to an immediate increase in acidity. Whether the increased acidity in these instances be due to dissolution, or whether dissolution be due to acidity, or whether there be no causal relation between increased acidity and dissolution, has not been definitely determined. The harder the body is driven by any stimulus, the more rapidly will latent energy be transformed into kinetic energy. The more rapid the transformation of energy, the more rapid the production of acid. The greater the production of acid, the greater also the strain upon the power of neutralization possessed by the liver and the suprarenals, and the greater the drain upon the body's store of alkalies and bases.

It is clinically known that when a patient is in a state of exhaustion resulting from infection, from injury, from shock, from starvation, from hemorrhage—from any cause whatsoever—he may never recover consciousness after the administration of a general anesthetic. It has been shown that when a dog is first starved and then anesthetized it invariably dies. The aged not infrequently die after short inhalation anesthesia. The tests were made in Crile's laboratory after the application of many kinds of stimuli. Both ether and nitrous oxide produced an immediate increase in the H-ion concentration—that is, both caused an increased acidity in the blood during anesthesia. After coming out from the anesthetic this acidity was neutralized by the animal in about thirty minutes. Increased acidity actually develops during the anesthesia itself, sometimes to a fatal degree. The starved condition is not only of considerable but of prime importance, since it means that the acid-neutralizing power of the liver has been surely impaired and possibly lost. Alcohol causes acidity, but not to such a marked degree as that produced by anesthetics. The H-ion concentration was not altered by morphine no matter how large the dose. When the administration of morphine precedes the induction of anesthesia, then a smaller amount of the anesthetic is required to produce complete anesthesia, and the H-ion concentration test shows that the acid is correspondingly less than in the anesthetized animal which has not received the preliminary dose of morphine. If, however, morphine be given after acidity has been produced by the anesthetic it prolongs the period of neutralization, and if given in large doses prevents the animal from overcoming the acidosis. That is, it would appear that morphine controls the mechanism which governs the neutralization or alkalinization of the blood.

The degree of acidosis seemed to be proportional not only to the length but to the depth of the anesthesia. The lightest possible anesthesia should be maintained therefore. With starved patients, with

patients whose vitality is at low ebb, in whom acidosis is already markedly present, the inhalation anesthetic may be absolutely contraindicated. If an operation is mandatory it may be performed under local anesthesia, or in twilight anesthesia produced by the gentlest administration of nitrous oxide oxygen.

Although both the preoperative and postoperative use of morphine is of great value, in certain cases when there is an existing or threatened acidosis its use is contraindicated, since it interferes with or prevents the neutralization of acidity in the blood, but bromides per rectum may be safely given to diminish the preoperative psychic strain. The preoperative and postoperative administration of sodium bicarbonate and glucose is of value also.

The ideal treatment then for patients handicapped by exhaustion in whom acidosis is present or threatened is, first, the preoperative administration of sodium bicarbonate and glucose and of bromides per rectum; second, twilight anesthesia; third, complete anociassociation by the use of local anesthetics and gentle manipulations so that but a small amount of the anesthetic is needed.

In bad risks as rapid a technique as is consistent with good work should be employed, that the period of anesthesia may be as short as possible; and the avoidance of worry, fear, and injury—since these factors also produce increased acidity.

TREATMENT OF SURGICAL TUBERCULOSIS BY RECALCIFICATION.

REYMOND (*International Abstract of Surgery,* January, 1915) states that the empirical treatment of tuberculosis with calcium salts is old. A theoretical basis for it was set forth in Robin's work, in 1895. Normal calcium metabolism is of such a nature that the amount of calcium present in the body cells and fluids is constant. If there are variations in the calcium intake or excretion, the skeleton assumes the function of regulation, giving up calcium when it is needed, or taking up any excess. Before and in the beginning of tuberculosis the calcium intake is decreased by gastrointestinal disturbances, acid fermentation, and general acidosis, and the excretion is increased by the action of toxins, increased oxidation, and fever. The consequent impoverishment is made up at first as far as possible by the skeleton, to such a degree that tuberculous patients often float on the water in their bath. Later, general calcium impoverishment takes place when the skeleton can no longer make up the deficit.

The question is yet in dispute as to whether the demineralization is a cause or an effect of tuberculosis. The facts remain that tuberculous lesions heal by calcification, that tuberculous patients are demineralized, and that the administration of calcium has a favorable effect on tuberculosis.

The treatment is not limited to the administration of calcium, but also undertakes to lessen the excretion of calcium. This is done by decreasing acid fermentation and by increasing the alkalinity of the body fluids. For this purpose overnutrition is avoided and sufficiently long intervals allowed to elapse between the meals. Alcoholic drinks are forbidden, as well as acid and fermentation producing foods (cheese and butter and sauces). Two hundred to three hundred grammes of bread should be eaten daily, also an abundance of vegetables, but little meat. The only drink allowed is carbonated lime-water. A powder is given three times daily, consisting of calcium carbonate 0.5, calcium phosphate 0.2, magnesium calcarea 0.15, sodium chloride 0.15. With the beginning of gray stool or constipation the dose is decreased.

The mode of action of the calcium treatment is not exactly clear; the assimilation of the calcium salts is possible. At any rate the skeleton takes up calcium, the teeth become hard again, oxidation decreases, and the fever declines. In patients in the first and second stages of pulmonary tuberculosis there is a rapid improvement in the general condition; on a light diet there is an increase in weight, which of course does not begin until the patient has been under treatment

a considerable length of time. Gradually the local symptoms and the signs on auscultation disappear. There are good results also in tuberculosis of the larynx. The same is true of tuberculous peritonitis, in which surgical intervention is only occasionally indicated, in the forms with ascites.

The author shows the favorable effect of the treatment in peritonitis, epididymitis, and cervical gland tuberculosis by means of case histories from his own and others' experience. In osteoarthritis the administration of calcium is a supplement to other methods of treatment.

GOITRE IN CHILDREN.

BUFORD (*Surgery, Gynecology and Obstetrics,* January, 1915) thus concludes a paper upon this subject:

Simple goitre is of frequent occurrence among children in Chicago and is associated with a definite symptom-complex.

This symptom-complex indicates a low grade of health, varying in each child.

Goitre usually occurs in certain geographic districts and appears most frequently when certain waters are used for drinking purposes. These waters are often known to contain certain sewage. The water of Chicago receives sewage from hundreds of farms, factories, villages, and cities. Because of this geographic distribution of the disease, corresponding to water routes receiving sewage and certain experiments showing that goitres do develop promptly when these waters are used exclusively, it seems probable that drinking-water is the chief cause of goitre. The water content causing goitre is probably bacteria or their chemical products.

Local infections, particularly those of the tonsils, adenoids, and teeth of children, may supply the excess of bacteria ingested and produce goitre either alone or in conjunction with the water-supply.

If these theories are correct the thyroid gland, which enlarges under these conditions, is an agent in the destruction of bacteria as the blood passes through it, or it provides a product to destroy these or their toxins in the blood. Buford states that he has been told that positive growths are now being obtained from goitres and from the blood of such patients. When the work of the gland is excessive it enlarges through hypertrophy, when compensation is incomplete or the dose continuously large or toxic constitutional damage follows.

Because of the location usually singled out in which hypertrophy begins, differentiation in function of the various areas of the thyroid gland is suggested.

Because invasions of the thyroid gland beyond the primarily enlarged nodule usually occur in the lobules immediately surrounding it, and this zonal plan of extension often continues, but only in toxic cases, overlapping function of the lobules is suggested.

The primary nodulation is a hypertrophy of compensatory character; if the cause is not removed the original lobe to take on enlargement continues to increase in size and results in cell damage; the process may extend to other lobules; the involved cells either become useless or the secretion of the lobule becomes toxic and there is spontaneous encapsulation; probably the capsule is firm and thick in proportion to the damage to its contents or the toxicity of its secretion.

These lobules in the lower pole of the right lobe, rarely in the left, are the common seat of benign adenomata of adults.

Because we do not often see this type of goitre in adolescents there is usually a spontaneous recovery during childhood.

Many of this type of goitres improve locally and some disappear on the giving of thyroid or the removal of focal infections, or both, while in all there are marked constitutional improvements.

By the term adolescent goitre Buford wishes to imply only goitre developing during adolescence. As he has observed them, they usually appear as bilateral affections, but are not infrequently unilateral. When unilateral, the swelling in the majority of cases occurs in the right lobe. Then enlargement is diffused through one or both lobes,

which are boggy; and rarely are there any nodular masses felt in the gland, such as are seen in goitre of childhood. From his experience he is of the opinion that these do not often undergo degenerative changes from long-standing hypertrophy, and therefore rarely show resulting benign adenomata. He also believes that glandular hyperplasia does occur in a great number of these, and that a larger number than we have heretofore recognized suffer from a mild degree of hyperthyroidism, while no small proportion develop early and distinct signs of it.

There is no doubt that the majority of uncomplicated cases of adolescent simple goitre undergo spontaneous cure and that the same occurs with most of the mild cases of glandular hyperplasia of adolescence in which the symptoms of hyperthyroidism have not been distinct. The latter are extremely slow to recover, resist treatment much more than simple adolescent goitre, and are made worse by thyroid feeding. Those which seem to resist treatment show especially vasomotor disturbances extending well into the lids, which are often puffy. They often show a bad complexion, poor muscle tone, and also easy fatigue. Their pulse-rate is high, the blood-pressure a few points low, and a fine regular fibrillary tremor is shown in the extended fingers. The heart becomes rapid and disturbs the patient upon slight exertion, but there is no tachycardia. These symptoms are the frequent forerunners of hyperthyroidism in late adolescence or early adult life.

Usually the patient developing goitre of adolescence who is destined to spontaneous recovery shows also a watery eye and flushed cheeks. The skin is usually clear, probably because of the shortness of duration and the undeveloped toxicity, in contradistinction to what we usually see in goitres of childhood.

Throughout this affection we have not had uniformly quick results from treatment during adolescence, yet sometimes the results are prompt. In cases showing little toxicity, and therefore but slight constitutional damage at or after the adult period has been reached, the results have been much more prompt. We do not know the cause of the usual type of goitre occurring during adolescence and must still content ourselves with that most vague explanation that it also is a diffused cell hypertrophy, caused by complex changes in the glands of internal secretion, which takes place at this period of life. What will benefit one of these will not always benefit another. Experience, however, shows that it is worth while to look to the water-supply, give iodine or thyroiodine when there is no suggestion of hyperthyroidism, and attend to focal infections. The author always encourages early afternoon rests in bed, graded athletics, and an open-air life.

In discussing the subject of goitre writers give much space to the subject of goitre of infancy, which is relatively rare, and dwell at length upon goitre of adolescence. Neither of these subjects appears to be nearly so important as goitre of childhood because of its frequency, the accompanying constitutional damage, and the permanency of that damage. Each recognition, diligent supervision, and treatment will spare most of these patients future deformities resulting from goitre and restore them to a good state of health.

NEWER KNOWLEDGE OF THE PATHOLOGY OF SYPHILIS.

FRÜHWALD (*Urologic and Cutaneous Review,* December, 1914) states that in 1903 Metchnikoff and Roux reported that they had succeeded in transferring syphilis to monkeys. By inoculating syphilitic material into chimpanzees they obtained an inoculation sore which clinically and histologically was analogous to the human primary lesion, and this was followed by secondary papular efflorescences on the skin and mucous membranes. The products of the disease were furthermore inoculable into other chimpanzees. More important was the fact established by the same authors that lower types of monkeys were also susceptible to the syphilitic inoculation, and from these the disease could be transferred

to chimpanzees. In 1906 Bertarelli was successful, by inoculating syphilitic material into the anterior chamber of the eye of rabbits, in producing a disease of the cornea which was absolutely analogous with human interstitial keratitis, and in which spirochætæ were found. Later, the simplicity of technique was increased by intravenous, intratesticular, and subscrotal inoculations. By these means the possibility was afforded to carry on investigations on a greater scale on a cheaper, more easily procurable, and more easily handled material than anthropoid apes.

This, as well as the fact found by Klingmüller and Baermann that the syphilitic virus is not filterable, encouraged a further search for the exciting agent of syphilis. This was soon accompanied by success, for on March 3, 1905, Schaudin, working in common with Erich Hoffmann, discovered in the tissue fluid of a closed genital sore a corkscrew-shaped, weakly refractile structure which he regarded as belonging to the spirochætæ and named the spirochæta pallida.

The third important discovery for the pathology of syphilis was the Wassermann reaction. After the method of complement fixation, discovered by Bordet and Gengou in 1901, had been proved on different bacteria, Wassermann, Neisser, and Bruck in the beginning of 1906 applied this reaction to syphilis, first in syphilitic apes and then in man.

If we wish to follow the course of syphilis from its inception on we must begin with the infection. Here a lesion of the tissue is necessary by means of which, according to Neisser's supposition, an entrance to the blood-vascular system must exist. To-day we know that just the exposure of the lymph spaces or of the deeper epithelial places is all that is necessary. Hoffmann and Brüning were able, by scarifying the cornea of rabbits and monkeys and rubbing in syphilitic material, to obtain an infection. As to the conduct of the spirochætæ at the site of inoculation the investigations of Levaditi and Yamanouchi provide us with an explanation. These authors found that in the rabbit's cornea a rapid destruction of the spirochætæ at first took place, and that only from the ninth day on did they rapidly multiply. We must presume that what first occurs is an acclimatization of the virus to its new surroundings; in addition to this we have also explained a part of the so-called incubation period, the time from the infection until the appearance of the primary lesion.

We know the situation of the spirochætæ particularly through the investigations of Ehrmann. If by the infection the spirochætæ do not directly reach the cutis they reside in the deep epithelial layers, from which they quickly enter the cutis. They are especially to be found where the syphilitic infiltration is slightest—that is, on the periphery of the primary lesion; they lie between the connective tissue fibrils, which form the origin of the lymph channels, on the newly formed capillaries, and thickest in and on the disease-changed lymph vessels. This recognizable predilection of the spirochætæ for the lymph-vessels is also in evidence clinically. It is worthy of notice that Ehrmann also found spirochætæ in the perineural connective tissue of a nerve and also between the fibrils. The systematic examination of the Wassermann reaction in primary syphilis shows that it becomes positive in about the sixth week after the infection. The change from the negative to the positive phase must be regarded as a generalization of the virus.

More precise conclusions are afforded in greater measure by the blood inoculations of Uhlenhuth and Mulzer into the rabbit's testicle. It is thus shown that the blood of patients with primary lesions and a negative Wassermann reaction, those namely in about the fifth week of the disease, already contains spirochætæ. The view of E. Lesser is thereby confirmed, he holding that the metastatic symptoms of syphilis, including the first exanthem and the primary lesion, have an incubation period of three weeks. In fact, we see that in the fifth week after infection spirochætæ are found in the blood, and in the eighth week we must expect the outbreak of the exanthem.

With the eruption of the first exanthem syphilis enters upon the so-called secondary stage. The question now arises whether the appearance of the eruption is synchronous with a sudden inundation of the skin with spirochætæ. Against this presumption there is the clinical observation that after an intravenous salvarsan injection in patients with a primary lesion the eruption often appears. If this reaction, according to the investigations of Luithlen, is due to the toxins of the disease, we must then conclude that the spirochætæ have for some time been present in the skin and begun their activity. Closer information has been afforded by blood inoculations; on the one hand we have seen that the spirochætæ are in the blood three weeks before, and on the other hand it has been shown that in an eruption of many weeks' duration spirochætæ are still found circulating in the blood. The fact seems to be, consequently, that we are not dealing with a sudden dissemination of the virus but with a constant supply of it, evidently from the glands.

The efflorescences of the secondary period are all dependent upon the presence of the exciting agent of syphilis. In the divers skin changes — roseolæ, papules, pustules, etc.—spirochætæ can be demonstrated either microscopically or by animal experiment. Especially conspicuous has been malignant syphilis which leads to early destruction. Here the demonstration of the spirochætæ is rather difficult; still, even when this is not possible microscopically they can be transferred—*i.e.*, inoculated into animals with a positive result. The findings of Pasini are worthy of notice. He found spirochætæ in a hair on an atrophic and pigmented spot after roseola; they lay in the root-sheath, in the medulla, and in the papilla.

Of the very greatest importance is the finding of spirochætæ in places which have not yet shown any syphilitic symptoms; some authors have succeeded in demonstrating spirochætæ in the apparently intact epithelial covering of the tonsil which was not at all the site of specific efflorescence. We must, therefore, assume that spirochætæ may be located in the skin and macroscopic changes visible. Clinical observations would seem to confirm this: on the one hand the appearance of leucodermia in places which were previously not the site of the exanthem, and on the other hand the so-called Jarisch-Herxheimer reaction. Since the introduction of salvarsan therapy this is observed more frequently, and consists of an intense reddening and swelling of the preëxisting exanthem with the appearance of efflorescences on areas of heretofore intact skin.

Upon the healing of the efflorescences of the secondary period, whether it be spontaneously or by treatment, syphilis enters upon the latent stage, that peculiar period in which the existence of the syphilitic infection allows no conjecture, but which is again followed by a new exanthem. The question as to where, during this period of apparent cure, the spirochætæ are located has at all times interested investigators. Here modern inquiry has brought light. Systematic examinations by the Wassermann reaction have shown that about 50 to 60 per cent of latent syphilitics give a positive reaction. Without going into the question whether this positive result indicates that the individual is still syphilitic, or whether he at one time was infected with syphilis, it is evident that in more than half the number of latent syphilitics the infection is not perceptible, while in the others it is. Thus we have gained an indicator for the discernment of singular cases which can be viewed apparently as infection through a latent syphilis.

Furthermore, we are able to demonstrate spirochætæ in the residual luetic patch. In the remainder of the primary lesion, exanthemata and papules, as well as in the epithelium of the tonsils, spirochætæ have been repeatedly found a shorter or longer time after the syphilitic symptoms have disappeared. It is, moreover, further possible to inoculate the same residues into animals with results so that it is evident that these spirochætæ are also virulent. This fully confirms the finding of Fr. Neumann, who demonstrated that places

formerly the site of a syphilitic exanthem showed histologically the remains of inflammatory perivascular infiltration, and that this was the principal cause of recurrences.

Further explanations have been afforded by blood inoculations. It has been shown that patients who outside of a positive Wassermann show no symptoms of syphilis whatsoever may possess spirochætæ in their blood.

The pathology of syphilis of the internal organs derives a particular advantage from the Wassermann reaction. In suspicious syphilitic disease of an organ the Wassermann reaction can afford valuable diagnostic aid, but it must be always kept in mind that the positiveness of the reaction only signifies that the individual is syphilitic and not that the particular organ is diseased syphilitically. Spirochætæ have also been demonstrated in the internal organs, in the adrenals, in the lungs, in the liver, in a gumma of bone, in aortitis and in arteritis of the cerebral arteries in the later period. It is also worthy of mention that spirochætæ have been found in the urine in cases of syphilitic nephritis, from which we may conclude as to the infectiousness of the urine in syphilitics.

Dohi and Tanaka were the first to show spirochætæ in the cerebrospinal fluid in papular syphilis, and Hoffmann succeeded in inoculating rabbits with the pathologically changed cerebrospinal fluid of a secondary syphilitic. The findings of Jakob, Steiner, Vanzetti, and others also show that testicular, intravenous, and intradural injections in rabbits can lead to changes in the central nervous system. These consist, essentially, of a lymphocytic and plasma cell infiltration in the vessels of the meninges, of a diffuse infiltration in the brain, proliferation in the glia, and single patches consisting at the periphery of lymphocytes and plasma cells and, in the center, of epithelioid cells. Changes are also found in peripheral nerves. The authors hope by the possibility of producing syphilitic changes in the nervous system of rabbits to clear up some questions pertaining to lues cerebri, and especially of the virus nervosus.

In just as revolutionary a way have modern investigators worked in the field of so-called metasyphilis. It has been proved that the Wassermann reaction is practically constant in progressive paralysis. In tabes dorsalis it is somewhat less frequently constant. Thus from clinical experience as well as from experimental inoculations the view is supported of a relationship between progressive paralysis and tabes and syphilis. Recently there occurred the demonstration of the spirochæta pallida in metasyphilis. It is known that Noguchi succeeded in finding spirochætæ in the brain of paralytics and in the posterior tracts of tabetics. His findings were quickly confirmed everywhere. It is also possible by brain puncture in the living patient to demonstrate spirochætæ in the dark field. Furthermore, brain substance from paralytics can be inoculated with success into animals, and rabbits can be infected with the blood and cerebrospinal fluid from paralytics and tabetics. These findings are of the utmost importance, for they show that in both heretofore cured metasyphilitic diseases spirochætæ are found not only in the affected organs but also in the blood and cerebrospinal fluid, and that these spirochætæ are virulent. Therefore a direct connection between syphilis, paralysis, and tabes must be accepted. Undoubtedly the last word on this question has not yet been said, but by no means is there any question, as Hoche and lately Meyer have shown on the basis of positive spirochæta findings, even though there are many negative results in existence, that tabes and paralysis are to be accepted as fully equivalent with the heretofore known forms of cerebral syphilis. Forster and Tomaszcewski, on the basis of their unsuccessful animal experiments, assume a biologically changed virus in paralysis; but it must be mentioned that Levaditi does accept a connection between the positive finding of spirochætæ and paralysis.

The question of hereditary syphilis has also experienced a distinct advancement

through the new modern investigations. It was formerly supposed that syphilis could be transmitted to the fetus either by the placental or by the germinal route. In the latter case there were two possibilities: there was either a spermatic or paternal or an ovulary or maternal infection. In other words, the syphilitic virus was either transmitted to the healthy fetus from the diseased mother through the navel blood, or it was already present in the ovum, or it was transported by the spermatozoön to the ovum.

In 1903 Matzenauer undertook a searchingly critical work on the question of hereditary syphilis and examined all the proof relating to germinative infection. He could find none of it that would stand the test, and his conclusion was that there is no hereditary syphilis without syphilis in the mother and that the placental route of infection was the only possible mode of infection.

In a brilliant way this was confirmed clinically through the Wassermann reaction. Investigations have shown that the apparently healthy mother of hereditary syphilitic children shows a positive Wassermann reaction as often as latent syphilitics. Colles's law, which declared that the healthy mother of syphilitic children is immune, was consequently abandoned. The Wassermann reaction shows, however, that she is only immune because she herself is latently syphilitic. At the same time the incorrectness of Profeta's law was substantiated. This law stated that healthy children of syphilitic parents are immune against syphilis. Here also it has been shown that they are immune for the reason that they themselves have syphilis.

A further argument in favor of the placental mode of transmission of the disease is the finding of Buschke. In a woman who had several times aborted and who two months before had given birth to a syphilitic child, but who personally showed no symptoms of syphilis, Buschke found spirochætæ in her inguinal glands.

Uhlenhuth and Mulzer have been able to infect rabbits with syphilis by inoculations with the blood of women who, a short time previously, had given birth to syphilitic children. These authors, by inoculating the milk of two women who shortly before had given birth to syphilitic children, as well as that from a pregnant woman with an exanthem, into rabbits have succeeded in thus transmittting syphilis to the rabbits. Arzt and Kerl have obtained equally successful results by inoculating rabbits with the milk of a woman who had latent syphilis.

Modern investigations in syphilis have also destroyed the one-time favorable view that the spermatozoa of syphilitics are not infectious, which was supported by Matzenauer. Finger and Landsteiner, as well as Uhlenhuth and Mulzer, have twice succeeded in infecting monkeys as well as rabbits with the spermatozoa of syphilitics. Of the patients who were used for these experiments, one of them suffered from a fresh papular syphilis four months old, another suffered from a recurrent exanthem with papules in the mouth, a third from hypertrophic and anal papules and papules in the mouth, and a fourth from a syphilitic orchitis.

It is evident, therefore, that the spermatozoa are also infectious even when there is no existing testicular disease. The virus can get mixed in with the spermatozoa in the long route from the testicle to the external orifice of the urethra. It must be emphasized, however, that the infectiousness of the spermatozoa does not indicate a paternal mode of infection of the fetus. When we say that the spirochætæ are conveyed by the spermatozoa to the ova and into the tube, it may with just as much justice be imagined that the ejaculation into the vagina or at the portio produces a primary lesion from which the maternal organism becomes infected, and then the fetus.

In any event, spirochætæ are demonstrable in the placenta of hereditary syphilitic children. There is no further question, when we consider that the infection of the fetus follows through the blood stream, that spirochætæ are also to be found in all

the organs, in the blood and cerebrospinal fluid of such syphilitic children. It is worthy of mention that the presence and demonstration of spirochætæ in the teeth, in the eye, and in the internal ear explains Hutchinson's triad: keratitis parenchymatosa, deformity of the teeth, and central deafness.

Equally important is the finding of spirochætæ in the borders of bone and cartilage in osteochondritis luetica, which explains Parrot's pseudo-paralysis. And not only the internal organs, but the secretions also —salivary, conjunctival, and nasal—contain spirochætæ. The latter can be successfully inoculated. The urine, perspiration, and sputum of hereditary syphilitic children must be regarded as potentially contagious inasmuch as Pasini succeeded in demonstrating spirochætæ in the sweat glands, lungs, and kidneys.

Before touching on the influence of modern investigations in syphilis on the therapy of the disease, it must be mentioned that it is possible to make the Wassermann reaction negative by a specific treatment. We have in the Wassermann reaction a means of judging the effect of therapy as well as an indication for the repetition of treatment.

By experiments on monkeys Beisser studied the question of the excision of the primary lesion, and, as in experiences on man, he obtained very variable results. This is perfectly clear if we recollect that spirochætæ are already circulating in the blood in the fifth week after infection. Still, excision must not be rejected as there is a likehood of killing some of the virus. In this regard Scherber's case is in point. The patient had the fresh lesion excised in which, histologically, spirochætæ were found almost to the edge of the incision, from which it would appear that the spirochætæ were completely removed by the excision. During an observation period of six years this patient remained free from any symptoms. He was able to observe a similar case for three years, in which he performed such an excision, although according to the condition of the case spirochætæ must have been present in the blood; the patient has remained clinically and serologically free from symptoms.

Disinfection experiments have been made on animals with a view to prophylaxis of syphilis, and the most varied antisyphilitic remedies were tried—preparations of mercury, arsenic, and iodine — on syphilitic animals. The results have, naturally, only a conditional value, as they cannot be carried over into human beings. The same thing has been observed in regard to investigations on immunity in syphilis and experiments on immunization. It appears pretty well settled that an actual immunity to syphilis does not exist, but only a relative refractoriness to a new infection as long as the disease exists.

TETANUS.

In a contribution to the *British Medical Journal* of January 2, 1915, dealing with the medical and surgical aspects of the war, KEOGH calls attention to a tabular statement, prepared by Major H. G. Pinches, on the results of treatment in 39 cases of tetanus. The methods of treatment were by carbolic acid and antitetanic serum. The deaths numbered 28, so that the general mortality was 71.8 per cent. Of 20 cases treated by the carbolic-acid method (2-per-cent solution) there were 14 deaths, a mortality of 70 per cent. Only five of these cases were treated by carbolic acid only; all died. The other 15 were treated by carbolic acid and antitetanic serum; of these nine died, a mortality of 60 per cent. Of the 19 cases treated by antitetanic serum alone, 14 died, a mortality of 73.7 per cent. In seven cases with an incubation period of five or six days, all died; in six cases with an incubation period of seven days, one recovered; in eight with an incubation period of eight days, two recovered; of fourteen cases with an incubation period of nine days or more, seven recovered. Four cases were treated with injections of magnesium sulphate in addition to carbolic acid or serum or both; all died, with the exception of one, which was also treated with both serum and car-

bolic acid; in this case the incubation period was sixteen days.

Hartmann in his communication regarding the prophylactic use of antitetanic serum states that during a recent tour of inspection he found that among 2473 wounded received at Besancon 36 cases of tetanus occurred, with 33 deaths, and that at Bourg among 900 wounded there were seven cases of tetanus. At neither of these places did a case occur among the men who had received injections of antitetanus serum. He expressed the opinion that if in all wounds without distinction—soiled, anfractuous, and simple—the patients were given a prophylactic injection of the serum, and this was repeated six or seven days later in anfractuous wounds, tetanus would almost entirely disappear as a complication of wounds.

EXPERIENCE WITH THE MATAS OPERATION OF ENDOANEURISMORRHAPHY.

GESSNER (*New Orleans Medical and Surgical Journal*, January, 1915) reports seven cases, adding one to those he has previously reported. The simplicity of the operation, its economy of vessel continuity, the resultant reduction to a minimum of the danger of gangrene through sacrifice of collateral vessels, appeal strongly for this method of treating aneurisms. The restorative method is applicable to the sacciform aneurisms, where one aperture alone exists between the vessel caliber and the abnormal cavity of the aneurism. Here, after provisional hemostasis has been secured, the sac is laid open, and from within it the one opening which conducts blood out of the artery is closed with Lembert suture, and its caliber is thus restored. After invasion of the sac the orifices of entrance and exit and of the collateral openings are closed by direct encircling sutures.

The reconstructive operation is applicable to aneurisms of the fusiform variety, a new channel being established by suture over a rubber tube placed beneath the two orifices as a guide in determining the vessel caliber. This provides a new arterial tube for the transit of blood, but one made of tissue that has already shown its unfitness to carry blood under pressure. The present tendency is to employ this method only in such cases as show deficient collateral circulation.

Of the seven cases reported, all were of negro descent. In three cases the aneurisms were fusiform. In one there was a false aneurism and three arteriovenous. Four of the cases were due to gunshot injuries. Four obliterative operations were done, three restorative and one reconstructive. No gangrene, no hemorrhage, nor recurrence followed the operation, nor did any of the cases die, though one perished of erysipelas eighteen days after operation, the infection being derived from another case adjacent to the patient in the ward; while a second died of multilocular prostatic abscess forty-three days after operation.

It will be remembered that Matas has reported 225 cases of aneurism treated by his method, to which he in the discussion on this paper contributes 33 more, thus making in all 258 cases. Over 91 per cent made complete recoveries. There was 8 per cent mortality, and of the entire number there were only three relapses. Matas states that whenever the parent artery opens into the sac by a single and comparatively narrow orifice, the restorative operation, which simply restores the lumen of the vessel by suturing the orifice, is an easy procedure which almost imposes itself as an obligate duty on the part of the surgeon. In case there are two orifices separated by a variable interval, one the inlet and the other the outlet of the sac, the question of reconstructing the parent vessel by an arterioplasty will depend upon two factors: first, the efficiency or inefficiency of the collateral circulation in the peripheral parts beyond the aneurism; and second, the conditions existing in the sac, which will or will not permit reconstruction of the vessel out of the material formed by the sac. In deciding for the obliterative or a reconstructive operation the efficiency of the collateral circulation is a matter of supreme importance. If this collateral circulation is demonstrated

to be efficient before the operation, it is evident that a simple obliteration of the orifices in the sac by suture is all that is required, and that an arterioplasty is unnecessary.

As to the means of determining the status of the collateral circulation, Matas has devised two simple procedures which find their separate application according to the topography of the aneurism. The first, the hyperemia or vascular color test, is applicable to all the aneurisms situated in the extremities. The prophylactic and occlusive band test, with the aluminum bands, is applicable to the aneurisms of the neck and root of limbs in which temporary ischemia cannot be obtained by a mechanical compressor, which will temporarily occlude the main trunk.

In every case the blood-pressure and condition of the heart should be carefully investigated, because if the blood-pressure is low collateral circulation will establish itself with difficulty, and if it is high a temporary occlusion of the aorta in the high intrapelvic aneurisms may lead to a dangerous strain on the myocardium. However, the high tension indicating a responsive heart will be safer than low pressure, which may have to be raised by cardiac stimulants (digitalis, adrenalin, pituitrin, and other means) before attempting operation.

In addition the coagulation time of the blood should be tested before an operation is undertaken in any case, but especially in aneurisms of spontaneous origin in arteriosclerotic subjects of advanced age, who are prone to thrombosis and embolism. While there is no absolute means of reducing this coagulability and diminishing the thrombogenic tendency, the suggestions recently offered by Kuhn, who confidently recommends the preliminary intravenous or hypodermic injection of glucose solution, aided perhaps by Wright's citric and acid lemonade, are worthy of remembrance.

REVIEWS.

MODERN MEDICINE: ITS THEORY AND PRACTICE. In Original Contributions by American and Foreign Authors. Edited by Sir William Osler, Bart., M.D., F.R.S., and Thomas McCrae, M.D. Volume IV: Diseases of the Circulatory System—Diseases of the Blood—Diseases of the Lymphatic System—Diseases of the Ductless Glands—Vasomotor and Trophic Disorders. Second Edition, Thoroughly Revised. Illustrated. Lea & Febiger, Philadelphia and New York, 1915.

This book represents Volume IV of the five-volume revised system "Modern Medicine" by Osler and McCrae. In the reviews of the previous volumes in these columns we have commented upon the eminently successful manner in which authors and editors concentrated in the revision the contributions of the first edition by the elimination of certain historical matter, etc. This volume, like its predecessors, bears evidence of the efforts to enhance the practical character of the work by increased stress upon diagnosis and treatment. A page-to-page comparison of the old and the new reveals the care and thoroughness with which the second edition has been prepared.

This volume is composed of five parts, as follows: (1) Diseases of the Circulatory System; (2) Diseases of the Blood; (3) Diseases of the Lymphatic System; (4) Diseases of the Ductless Glands; and (5) Vasomotor and Trophic Disorders.

Part 1 covers 602 pages, over half the book, and includes fourteen chapters. Diseases of the circulatory system comprise so great a part of the physician's practice that the various chapters from the pens of the foremost writers in the various fields which they cover will be frequently consulted and with profit. The introductory chapter by C. F. Hoover takes up the general considerations in cardiovascular disease. The problem which confronts the physician in a given case is, to quote Hoover, "which of the many factors in the maintenance of the circulation are at fault?" A discussion of some of these problems, such as the distribution of the blood, rôle of auricles, valvular mechanism, myogenic and neurogenic theories, dyspnea, the work of the heart,

etc., is presented. Chapter 3, by T. Lewis, amplifies and extends Hoover's discussion by a consideration of the rate and mechanism of the heart-beat. This field of cardiovascular study has been the subject of many careful investigations in the recent past, and no one is better qualified to write about them than Lewis, who has contributed so much original work himself. A knowledge of the mechanism of the heart-beat is necessary to a knowledge of such pathological types as (1) disturbances of impulse production, (2) heart-block, (3) premature contractions or extrasystoles, (4) simple paroxysmal tachycardia, (5) auricular flutter, (6) auricular fibrillation, (7) alternation. The recognition of these types paves the way for a rational treatment based upon certain principles which Lewis describes. Space forbids detailed discussion of the other many excellent chapters of this section: thus Diseases of the Pericardium by A. McPhedran; Diseases of the Myocardium by R. H. Babcock; Acute Endocarditis by Sir William Osler; Hypertrophy of the Heart by A. G. Gibson; Insufficiency and Dilatation of the Heart by A. G. Gibson; Diseases of the Valves of the Heart by Sir William Osler; Functional Diseases of the Heart by C. F. Hoover; Congenital Cardiac Diseases by M. E. Abbott; Diseases of the Arteries by Sir William Osler; Aneurism by Sir William Osler; Thrombosis, Embolism, and Phlebitis by C. Blumer; Diseases of the Lymphatic Vessels by A. S. Warthin.

Part 2 is devoted to Diseases of the Blood. R. C. Cabot discusses the general pathology of the blood-forming organs, pernicious and secondary anemia, chlorosis, and leukemia. Purpura and hemophilia are considered by J. H. Pratt, whose contribution on these difficult subjects is particularly clear and lucid. Purpura, especially the so-called idiopathic type, is shrouded in mystery, and the factors in its pathogenesis, the blood-vessels, blood-platelets, retraction of clot and coagulation time, are discussed in detail. In the diagnosis of a suggested case of hemophilia, Pratt states that "the coagulation time should be determined by an approved method. The blood should be drawn from a vein of the arm through a hollow needle. Experience has shown that there is no danger of excessive hemorrhage from this procedure." Many have felt the need of much caution in obtaining blood for coagulation time studies in hemophilia, and this stand of Pratt will have much weight in determining the most extended use of the diagnostic measure.

Part 3 includes chapter 18 on Diseases of the Lymphatic System by A. S. Warthin; and chapter 19 on Hodgkin's Disease by W. T. Longcope.

Part 4 comprises Diseases of the Ductless Glands. The major portion of this section has been contributed by G. Dock, who discusses the adrenal glands, pituitary body, pineal body, and thyroid gland. The newer knowledge of the pathology and clinical manifestations of ductless gland disturbances are clearly presented. Reference is made to the current tendency to consider seriously the early suggestion of Pineles (1899) that probably in all cases of ductless gland diseases more than one gland is involved, and many polyglandular syndromes will be recognized as our knowledge of these structures increases. The final chapters on diseases of the thymus and diseases of the spleen are by A. S. Warthin and I. P. Lyon respectively.

Part 5, the final section of the book, includes three chapters from the pen of that master mind of to-day, Sir William Osler. These chapters deal with Raynaud's disease, angioneurotic edema, diffuse scleroderma, and erythromelalgia.

In conclusion it may be stated with confidence that this book, like its predecessors, presents modern medicine, its theory and practice, in an authoritative way, and may be consulted with profit by the conscientious physician who wishes to aid in the solution of the many difficult problems which arise in the care of the sick, both in the consulting-room and at the bedside.

E. H. F.

THE EXTRA PHARMACOPŒIA. By W. Harrison Martindale, Ph.D., F.C.S., and W. Wynn Westcott, M.D., D.P.D. In two volumes. H. K. Lewis, London, 1915. Volume 1, 14s.; Volume 2, 7s.

In notices of previous editions of Martindale and Westcott's so-called Extra Pharmacopœia we have pointed out that it is in many respects an indispensable volume to both pharmacists and medical men. Volume one contains the bulk of the information. In volume one, as in previous editions, the first portion of the book is taken up with abbreviations, weights and measures, but the greater portion of the volume deals with the Materia Medica, Official and Non-official, alphabetically arranged, and with Vaccines, Antitoxins, Organotherapy, Antiseptics, Poisons, and finally there is a Therapeutic Index of Diseases and Symptoms.

In volume two, which is less than half the size of volume one, and which is in its nature supplementary to volume one, we find a large amount of valuable information dealing with drugs, the means by which they are tested, and their clinical applications. There is also in this volume a statement as to the constitution of a large number of proprietary or patent medicines.

If there is any book, large or small, which contains as much valuable information as do these two small volumes we have yet to be acquainted with it. Martindale and Westcott's Extra Pharmacopœia soon becomes a necessity to those who employ it. It has proved of the greatest possible service to us for many years, and we therefore welcome the appearance of every new edition.

THE ALIMENTARY TRACT. A Radiographic Study. By Alfred E. Barclay, M.A., M.D., M.R.C.S., L.R.C.P. MacMillan Company, New York, 1915. Price $4.00.

We presume that the high price of this little volume is due to the radiographic plates which are scattered throughout the volume. It is, as the author says, in essence a thesis, and was presented for the degree of M.D. at Cambridge University in 1912. It seems that Sir Clifford Allbutt, Sir William Osler, and others, thought so well of the thesis, when it appeared as a contribution to the *Medical Chronicle,* that they suggested that it should be put in book form. To this original thesis has been added Chapter 8 on the Etiology of Gastric Ulcer. Altogether the volume contains 189 pages. After introductory matter it takes up the technique involved in examining patients with the *x*-ray, the methods of routine examination, and then follows a chapter upon the diagnosis of the affections of the esophagus, studies of the normal stomach and the pathological stomach, with special chapters on gastric ulcer, hour-glass stomach, and carcinoma of the stomach. Chapter 9 deals with various gastric conditions, such as air-swallowing, adhesions, foreign bodies, displacements, and is followed by a chapter upon conditions of the small intestine and the discussion of the causes of gastric and duodenal ulcer. Chapter 12 deals with the large intestine both as to organic disease and functional disorder. Evidently the author has done all his work by the use of bismuth and has not employed barium, which, at the present time, seems to be preferred by those who know most about the subject. Quite a copious bibliography closes the volume, and we are glad to see that the name of Dr. Pfahler of Philadelphia is frequently quoted as an authority on these subjects.

MEDICAL ELECTRICITY: ROENTGEN RAYS AND RADIUM. With a Practical Chapter on Phototherapy. By Sinclair Tousey, A.M., M.D. Second Edition, Thoroughly Revised and Greatly Enlarged. Copiously Illustrated. W. B. Saunders Company, Philadelphia, 1915. Price $7.50.

When the first edition of Dr. Tousey's book appeared five years ago it immediately became one of the recognized authoritative works in the English language upon this important subject, and it has maintained this position. It affords, as its title indicates, a complete and exhaustive discussion of electricity as it is employed for all purposes in medicine. It gives a clear, practical, and interesting description of the use of the *x*-ray for diagnostic and therapeutic purposes, a very large part of

the book being devoted to this important subject. Not only are the various forms of apparatus and their uses clearly described, but there are illustrations showing the effects produced in patients by the use of *x*-rays in various forms of malignant growth. The book is closed by a very complete index, and the physician who wishes to have on the shelves of his library a complete, useful, and practical summarization of electricity as it is used in medicine today can find no better work in the English language than this.

DER STOFFWECHSEL BEI EXSUDATIVER DIATHESE. By Dr. Albert Niemann. A. Marcus & E. Webers, Bonn, 1914, 56 pp. Price 2.80 M.

Dr. Niemann has studied the respiratory metabolism in three cases of uncomplicated exudative diathesis of Czerny. He believes the disease to be based upon a special disturbance of metabolism, with tendency to increased heat production. In explanation of the existence of a type of this disorder accompanied by increase in body weight, it is pointed out that this is due to changes in water content rather than to the formation of true adipose tissue. Not the skin disorder but the disturbance of nutrition is the thing to be primarily combated. It cannot, however, be said to be here shown that the increased respiratory metabolism is other than one effect of some primary disturbance of food absorption or of the salt metabolism.

The views of others as to the etiology of exudative diathesis are discussed, as well as the proper limitations of the term, and some therapeutic suggestions are made, such as the use of washed butter for cows' milk in the diet. O. B.

THE COMMONER DISEASES: THEIR CAUSES AND EFFECTS. By Dr. Leonhard Jores. Authorized English Translation, by William H. Woglom, M.D. Illustrated. W. B. Lippincott Company, Philadelphia, 1915. Price $4.00.

The basic facts contained in this volume were originally brought together in the form of lectures delivered in the Pathological Institute of the University of Marburg. The lectures proved so profitable to those who attended them and were so popular when they appeared in book form in the German that Dr. Woglom decided to make an English translation, eliminating a few points which seemed to be unnecessary in a volume published for American readers, and supplementing the statements of the author in other instances when this seemed to be advisable. Altogether the book contains 34 chapters, and may be said to be a discussion of the various diseases met with by a practitioner of internal medicine. It is copiously illustrated, containing no less than 250 illustrations, some of them in colors, anl all of them good. The type is large and easily read, and the book will prove most interesting to the graduate physician, although it is not sufficiently fundamental in its arrangement to be suitable for the student. A very copious bibliography of the various conditions which are discussed closes the book, which is emphatically a clinical volume, discussing the cases seen in a large clinic in a manner usually followed by a master teacher.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, U. S. ARMY. Second Series. Volume XIX. U-UZIELLI.

All medical men who are familiar with medical literature are also familiar with the Index Catalogue of the Surgeon-General's Office, which in its first and second series is universally recognized as being the greatest index of literature ever developed. The present volume contains 3046 author titles, representing 1353 volumes and 2744 pamphlets. It also contains 3736 subject titles of separate books and pamphlets and 32,739 titles of articles in periodicals. We are interested to know that the Library of the Surgeon-General of the U. S. Army now contains 189,171 bound volumes and 325,639 pamphlets.

THE NURSING AND CARE OF THE NERVOUS AND THE INSANE. By Charles K. Mills, M.D. Third Edition, Revised by the Author, Assisted by N. S. Yawger, M.D. J. B. Lippincott Company, Philadelphia, 1915.

A number of years ago Dr. Mills placed in book form the statements made by him in lectures delivered at the Training School for Nurses at the Philadelphia Hospital and

at the Woman's Hospital Training School for Nurses, his lectures dealing especially with the care of those who are insane or suffering from serious nervous complaint. Since 1887, when the book first appeared, it has been published twice, in 1904 and now in 1915, although the preface to this third edition is dated July 24, 1914. The first chapter deals with the Qualities and Qualifications of a Good Nurse for Nervous Patients, with the Diagnosis and Management of Various Functional Forms of Nervous Diseases and with the Management of Patients Addicted to Drugs. The second chapter deals with Massage and Remedial Measures. The third chapter discusses Hydrotherapy in its Various Forms. Chapter four describes the Application of Faradic Electricity to Various Portions of the Body, and chapter five deals with the Nursing and Care of the Insane.

URINARY ANALYSIS AND DIAGNOSIS BY MICROSCOPICAL AND CHEMICAL EXAMINATION. By Louis Heitzmann, M.D. Revised, Illustrated. William Wood & Company, New York, 1915.

That there should be a third edition of this excellent work sufficiently attests its value. Though clinical symptoms are outlined the purpose of the work is to evidence the importance of laboratory studies, to show the accuracy of the findings, and to set forth in adequate detail the modern accepted technique both for the microscopist and the chemist. Indeed, the author states that many years of experience and teaching have shown him that correct diagnoses by means of microscopical examination of urine can frequently be made in cases in which other methods are of little or no practical value.

To this edition he has added many new tests which can be carried out by the properly trained and intelligent doctor. It is interesting to note that he strongly insists that epithelia can be correctly located by the microscope and that valuable deductions can be made therefrom. In such studies low magnifying powers, such as are frequently used for urine work, are decidedly useless, and a microscopical diagnosis of the different features seen in urine should never be attempted with a magnifying power of less than 400 or 500 diameters.

Part I is devoted to chemical examination, the various tests being given in such form as makes them readily applicable by the practitioner of medicine. There is a chapter devoted to the recognition of epithelia not entirely convincing to those who have endeavored to find a differential diagnosis on this basis. Microörganisms, Parasites, and Extraneous Matter are treated at length.

Part III is devoted to Microscopic Urinary Diagnosis, and there is a section upon Determination of the Functional Efficiency of the Kidneys, the phenolsulphonephthalein test being regarded as the most accurate.

OBSTETRICAL NURSING. By Charles Sumner Bacon, Ph.B., M.D. Illustrated. Lea & Febiger, Philadelphia and New York, 1915.

The author states that the needs of the medical student and physician have been kept in mind in the preparation of this book. "The obstetrical nurse should know as much of the science of obstetrics as is necessary for the intelligent comprehension of the rules of her art." Bearing in mind the fact that the nurse is a physician's assistant, and that she may be alone with the patient in delivery, he dwells on the subject-matter in greater detail than do books designed primarily for nurses.

There are excellent directions given concerning the preservation of the nurse's health, and she is warned against making unasked suggestions to the doctor. Following general directions there is a chapter devoted to Anatomy, Embryology, and Physiology in which is found a graphic picture of the external genitals. Pregnancy is discussed at length, particularly in regard to its complications. Labor, its stages, mechanism, management, and preparatory and after treatment are considered in a most satisfactory manner. Therefore, in admirable detail, is given the treatment appropriate to the infant.

This book is well adapted to the purpose for which it is written, nor could any of its subject-matter profitably be omitted.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month again I have to report with regard to the general condition of medical affairs in London, "no change." It looks as if succeeding months will also start with the same remark. There is still a considerable number of wounded and disabled coming in from France, and the majority of the medical cases are affected in the same way as before, namely, with "frost-bite." It is, however, pleasant to be able to report that we are now having a very much milder form of the condition than formerly, and I have not, during the last two months, seen any case with gangrene such as reported in November and December. These unfortunate individuals frequently complain of anesthesia, which is more or less of the sock or boot type corresponding to the areas covered by these articles. The skin is generally rather redder than normal, but edema is quite uncommon, and they do not complain of hyperesthesia even when sensation is returning. It passes off from above downward, and the toes are the last to recover their sensation; and in most cases the big toe remains anesthetic longer than the other parts of the foot. The condition also affects the deeper parts, and on trying to walk a complaint is often made of pains in the same areas as are affected when acute flatfoot is coming on, so that it is better to keep the people in bed for a week or two after sensation has returned than to let them get up as soon as sensation is normal. During the acute stage the toes are often hyperextended, and in some cases this is associated with a painful cramp affecting the extensor muscles of the leg. This is best got rid of by extending the foot to the full and gently rubbing the affected muscles. Sometimes, too, when one leg is more affected than the other, it is possible to detect that the artery is smaller on the affected side than it is on the other. A larger proportion of those affected with this condition seem to be people who have a bad terminal distribution, as demonstrated by the presence of blue hands, which are generally cold, and cyanosed ears. These people seem to improve much more rapidly when given a little thyroid extract. Speaking of thyroid reminds me of another man wounded in the leg, from whose account I learned that his hair came off completely in the course of forty-eight hours after the explosion of a shell quite close to him, which had also rendered him temporarily deaf in one ear. He has a new crop of hair growing, but not very rapidly. The best treatment for these cases of "frost-bite" seems to be to put them in bed and keep them there, and keeping their feet warm and dry by wrapping them in a quantity of wool, otherwise giving them general treatment only. Where spasmodic contractions occur, however, the constant current given for half an hour or an hour once or twice daily seems to have a very good effect. The majority of them seem to sleep fairly well, and they have enormous appetites, and beyond the condition of their feet have no other complaints. One fact very noticeable in these cases is that when the weather turns cold or snow falls they evidently feel the climatic change acutely, as the other day when snow fell they all sneaked to bed very quietly, without any complaint or offering any explanation. I know of a somewhat comparable case of a man who had been struck by lightning, who, whenever a thunder-storm developed, always felt his pains in the part that had been struck; so possibly these men with the "frost-bite" will have a similar disability.

The London streets are still darkened at night, but everybody is so much accustomed to it that it is now an ordinary topic of conversation comparable to the weather. Much more remarkable is the progressive disappearance of the motor buses. No numbers can be given, but it is quite obvious to the pedestrian, especially if he is accustomed

to traveling by bus, that he has to wait much longer for one of these vehicles now than formerly. A few months ago the rules as regards the overcrowding of buses were apparently abrogated, but recently police regulations have been enforced with the usual stringency, and this fact perhaps attracts attention to the diminished number. Taxicabs also seem to be less numerous, and the drivers are on the whole much older men than formerly. The number of special constables has not diminished; if anything, it has increased, which allows a large number of the regular police force to go abroad.

Apropos of the recent agitation in Germany to the effect that Germany and Austria were on the verge of starvation, the *Times* quotes from the *Lancet* a paper written by some German scientists. The authors have reckoned that with economy there is quite enough food to supply the whole country, at all events, until next harvest without getting any more in. I have not read the original communication from the *Lancet,* but this statement recalls a lecture given by a professor of physiology (I withhold the name deliberately) when I was a student. It was on the subject of nutrition, the value of calories, and so forth, and he stated the amount of such calories necessary to keep the body alive. He stated that a well-known American professor had been experimenting on these grounds and had himself been a subject of experiment, and, as far as I remember, had only been taking sufficient food, as estimated in these values, to replace the energy expended. It was explained to us that he did keep alive, but lost weight, and among the numerous inconveniences which arose from this experiment we were told that he developed such a degree of bad temper that his wife refused to live with him. It will be interesting to see what will happen in this case if the German scientists have estimated their food supply on values only equivalent to the loss of heat and energy and might give rise to much speculation as to its effect on the German nation.

The London School of Medicine for Women has been issuing an appeal for money to complete the buildings which house students during their preliminary studies. At the present time this school is probably the only one in the country which has anything like its usual number of students, as a large number of men from other medical schools enlisted during the early months of the war. Apparently the increase of students in this school has been of steady progress during the past three or four years and is not in any way to be attributed to the present national situation. It is, however, pointed out that there is no question of the women ousting the men, as in the past few years there has been a decrease in the number of men who enter for the medical profession. There promises to be a certain dearth of medical practitioners in the next five or ten years. A good proportion of the medical women come from the families of doctors and other professional men, and the prejudice which formerly existed against women doctors is gradually dying away. At least two medical women have been running a hospital in France for the wounded and have been highly complimented by the Director of Medical Service, and, I am given to understand, are to be asked to establish a base hospital in this country in the near future. Although this is indeed a bad time to launch an appeal I hope they will have every success in raising the sum they require.

There is an old adage which says "A green winter makes a full churchyard," of which this year seems to be a remarkable fulfilment. On looking down the "agony column" there seems to be an extraordinary number of old people dying at the present time. In the absence of any definite epidemic of influenza or such like there is probably some contributory cause. Such may well be the present national upheaval.